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Original Communications.

TENOTOMY BY OPEN AND SUBCUTANEOUS INCISION, TUBERCULAR SYNOVITIS AND OSTEITIS OF SHOULDER.

By H. Augustus Wilson, M.D.,*

THE case on which I performed tenotomy of tendo Achillis by open incision, a week ago, has been doing nicely. There has been no elevation of temperature, but there has been a very instructive occurrence which I wish to speak of, not as an illustration of failure, but as an instance of what is apt to follow the application of a plaster-of-Paris dressing. The patient complained of pain twenty-four hours after the operation, although there was no apparent cause. I cut out a fenestra in the plaster, however, and found the wound in a healthy condition. The patient then complained of pain higher up the limb, and the resident physician removed the cotton which covered the spot, when the pain left instantly. The efforts at placing the foot into its proper position had so pressed the back of the leg against the plaster that the pain was produced by pressure, and the removal of the cotton had done away with this undue pressure and

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brought relief. The patient is now doing satisfactorily.

This child is a case of infantile paralysis, upon one side, with the foot in the position of equino-varus and in which I divided the tendo Achillis subcutaneously at our last meeting. I bring her before you now and remove the dressings for the first time in order that you may see the result. So long as the wound is perfectly healthy and covered by an antiseptic dressing, you need not fear the discoloration of the latter, because it is due to blood, and this is in itself a safeguard against infection. There is a little ecchymosis here at the seat of operation, otherwise the foot is in a perfectly healthy condition. Of course, it is still a paralytic foot. We do not expect to recover entirely the muscular action, but we desire to put the foot in the most useful position, so that it may have the best opportunity for recovering, and then have recourse to judiciously-applied gymnastic exercises for the purpose of re-establishing the muscular functions.

The form of these exercises applicable to this case will require elaborate study as soon as the divided tendon has united, and will be adopted in accordance with exact science of mechanico-therapy. Nothing is more discouraging to a patient than to say he needs exercise without carefully directing the kind that will be beneficial. It should be as much a prescription as any other remedial measure, in order to obtain proper results.

It is my invariable custom in prescribing exercise for any condition to give specific directions as to clothing, proper time of day, length of time, and more especially the character of exercise in detail. I generally discourage the use of gymnastic apparatus of any kind, because I know that we possess in our own bodies all the apparatus that can ever be needed, and it requires only judicious use under proper direction to render it available. Time will not at this hour permit me to do more than casually allude to this subject which I shall bring before you in its proper place.

The next case I will bring before you this morning is one which will illustrate still further the pathology of the disease I described at our last clinic,—the fact that many of the chronic diseases of the joints have their origin in a primary osteitis, and that this osteitis may go on to resolution by absorption, as I showed you the other day. Another way nature takes to cure the osteitis is to have it break through the periosteum, the soft tissues, and the skin. Then there is the third possible method of breaking through the cartilage into the joint, thereby setting up a synovitis, which is sometimes the first thing to call our attention to the real site of the disease. We are often unable positively to recognize it as long as it exists as an osteitis alone. This case represents the third form, where a primary osteitis has existed, which has gone on to caseous degeneration, suppuration, and rupture into the shoulder-joint, producing a synovitis. It will be our method of treatment to-day to trace the sinus to the site of the tubercular deposit, remove it in its entirety, and then dress the wound with iodoform, our favorite antiseptic, using drainage for twenty-four hours, and hoping to have a good result. In addition to synovitis of the shoulder-joint, the axillary glands have become involved in the tuberculous process, and the entire system of the child is in an unhealthy condition. There is not to be expected here a complete recovery of the usefulness of the joint, but we hope to arrest an extension of the disease to other situations. As you know, the tubercle bacillus is prone to wander from one site to another and thus infect various other portions of the body. It is, therefore, to arrest any such dissemination of the disease that we propose to operate to-day.

These tubercular sinuses are extremely difficult to trace, and we are apt to lose sight of them in the open wound. To avoid this I have resorted to two methods, usually with satisfactory results. The first is by the use of a probe inserted to the farthermost extent of the sinus before operating and allowed to remain to act as a guide. There is one objection to this method, however. If there exist several sinuses radiating in different directions, the probe can only follow one, and the others are apt to be overlooked. Therefore, I have resorted to the employment of pyoktanin, a petroleum product and an antiseptic in addition, the use of which I recently advocated before the Philadelphia Academy of Surgery in the treatment of long-standing sinuses having their origin in a tubercular joint. There is one objection to its more general use as an antiseptic, and that is its staining property, which indelibly stains everything with which it comes in contact. It is, in the powdered form, of a greenish, or, we might say, of an olive-green color, but in an aqueous solution it becomes of this beautiful purple color. A syringeful of this solution is injected into the sinuses, and it reaches

every recess, and remains in contact with the tissues for a sufficiently long time to stain them, and renders the lining membrane of the sinus plainly discernible when the parts are laid open.

You see here, at this point of the shoulder, anterior to the acromion process, a villous-looking opening, which is the mouth of a sinus. Through this I inject the coloring substance. Now, by means of a probe, an additional guide is obtained, and I find it passes down to the extent of very nearly two inches. I am not positive whether or not the probe is in contact with dead bone, though the indications are that it exists. I shall enlarge the opening sufficiently to enable the entrance of a finger, and now perceive very clearly the eroded head of the humerus. I find I can feel very readily the sinus as it extends downward. Those who are sitting near can see the effect of the pyoktanin on the tissues, which are deeply stained and decidedly conspicuous. The probe passes clear through the joint, and in order to facilitate the drainage I shall make a counter-opening on the under side of the shoulder, cutting down upon the probe, which I can feel through the skin. I shall lay open the joint still further in order to arrive at the seat of the necrosis, and after doing so I find another point of caries very clearly on the head of the humerus, at a point I can readily reach without exposing much of the joint and surrounding important structures. By means of a chisel I can reach in and carefully but thoroughly cut out the involved tissue, for the diseased portion of the bone is soft and spongy, as well some of the sound bone, so as to leave only healthy structure. I wish for your sakes that you could have your fingers in this wound in order that you might feel the difference between the healthy and the diseased bone. The necrotic points, now cut into one cavity, are extremely small, about the size of a bean, indicating a decidedly more favorable prognosis in the case. I have now come down to good healthy cancellous structure within, but the entire joint has been disorganized to a greater or lesser degree by the intensity of the inflammation set up. By means of an injection of the ten per cent. emulsion of iodoform in olive oil I can fill the whole joint and site of the action of the disease with iodoform, and thus arrest the action of the disease-germ. By means of our counter-opening we can keep up our drainage, inserting a seton of candle-wick rendered aseptic,—something that is not often seen in these days,—not to act as a seton to keep up an irritation, as formerly used, but solely to serve for the purpose of drainage to prevent an accumulation of any of the detritus of the disease. Absolute rest will be insisted upon, and for this purpose we shall resort to a method which I have been in the habit of using for years in appropriate cases. You are all acquainted with the form of the surgical bandage known as the Velpeau bandage, which is used in the treatment of fractures of the clavicle. In children it has been found impossible to hold the shoulder still by means of this bandage. The use of adhesive plaster has also been found to be of uncertain service here in retaining the hand and arm in a fixed position. Therefore we have resorted to the use of a plaster-of-Paris bandage in the form of a Velpeau; and have found that this will hold the joint absolutely at rest, and the child will be utterly unable to move the affected parts. It maintains rigidity of position, entire rest of the shoulder-joint, which it supports by means of the elbow-joint resting in the apparatus, but it has the disadvantage of preventing access to the parts beneath, unless a fenestra or window be made. Before the bandage hardens, Dr. Mann will make one or two fenestræ for the purpose of inspecting the parts from time to time without disturbing the position of the arm. The necessity of thorough immobilization is impressed upon you, I have no doubt, by this time.

In these holes, made in the plaster-of-Paris case, the antiseptic gauze ordinarily used in surgical dressing will be applied, and retained in position by adhesive strips attached to the case.

The joint will be undisturbed for twenty-four hours, at the end of which time the drainage candle-wick will be removed and the clean dressing of the wound take place, after which it will not be touched for from ten days to two weeks.

I wish I could tell you that there were indications of a favorable prognosis in this case, but in all candor I must tell you that the functions of this shoulder-joint have already been greatly destroyed. I believe, however, that there will be a good recovery from the tubercular invasion of the joint. I fully expect to have considerable motion and usefulness of the joint, but there are sufficient evidences of tubercular deposits elsewhere to make me expect fresh outcroppings in other parts. When these occur they will be dealt with in a manner similar to that resorted to to-day.

THE TREATMENT OF SCIATIC NEURITIS BY THE LOCAL ABSTRACTION OF BLOOD.

By F. Gundrum, M.D., Escondido, Cal.

NO physician can appreciate the excruciating pain of a severe attack of sciatica unless he has suffered himself, nor can he feel how grateful the poor sufferer feels for prompt relief unless he has had such relief himself. Therefore, those remedies which give prompt relief in well-selected cases should be known and used by the practitioner. I do not desire to go into the pathology of the disease, except to say that I believe the great majority of cases of sciatica are due to inflammation of the nerve-sheath, or the nerve itself, and that rheumatism, gout, syphilis, anæmia, etc., have very little to do as factors in the causation of the disease.

The great majority of cases that have come under my observation were healthy males, above the age of twenty-five, and inclined to corpulency. In nearly every case I have traced the attack either to a direct injury or taking cold, most frequently the former, the most frequent injury being strain or overstretching of the nerve, by lifting heavy weights from the ground, or remaining in a stooping position, where the nerve is kept continually on the stretch, besides being inordinately pressed on by the overlying muscles. The inflammation may involve a considerable extent of the nerve, as shown by the extreme tenderness on pressure over its course down the thigh. At times it is entirely confined within the pelvis, and I have good reasons for believing that the inflammation may affect any one of the individual nerves composing the great sciatic. Believing that the reduction of the inflammation in the nerve is the quickest way to overcome the disease, I have acted on this principle for nearly twenty years, by using one of the retired methods of treatment,—viz., wet-cupping,—the first subject being myself. I will give a couple of cases from the many I have treated by cupping, which will illustrate its beneficial effects.

Case I.—This case was myself. In 1872, when I was 26 years of age and in robust health, I rode nearly night and day. My vehicle was a light two-wheeled sulky, which had the seat so much tilted back that I had to lean forward very much, thus keeping the sciatic nerves on the stretch all the time. Besides, there was a wire-railing around the seat just high enough to strike the sciatic nerve a little below where it passes out of the pelvis. This soon had the undesired effect of producing the severest sciatic neuritis imaginable. The pain was principally in the lower lumbar region and the upper third of the thigh. The nerve was extremely tender even to light pressure from where it issues through the great sciatic notch to the junction of the upper and middle third of the thigh. For four weeks nearly every known method of treatment was tried, with but temporary or no benefit. I suffered horribly unless well under the influence of morphine or brandy. Believing in the inflammatory nature of the disease, I had my brother apply fourteen wet cups over the lower lumbar region, on the hip and down the thigh over the course of the nerve. As the blood began to flow I began to feel easier, and, to make a long story short, I suffered no more pain, and took no more morphine or brandy. I stayed a week in bed, got up, and went to the springs to get away from business and recuperate my strength.

Case II.—Mr. C., a Frenchman, aged 52; has always been very healthy. He eats a great deal of meat and drinks liberally of wine, and has accumulated more adipose tissue than is good for him, weighing two hundred and ten pounds. About December 1, 1891, he handled a considerable amount of grain in bags, and sowed grain for two days, which started a pain in his back and hip. He thinks he also took cold while at work. The pain gradually grew worse. Domestic remedies were tried for rheumatism, and a gout pill was tried. December 20 he was taken suddenly worse, suffering excruciating pain, and his son then came for me. I found him on a "pallet" on the floor, before the fireplace, yelling from pain. The pain was located in the posterior part of the hip, down the thigh for twelve or fourteen inches, and in the lower half of the outside of the leg and foot. The nerve was extremely tender to pressure in its upper part, but nowhere else did pressure elicit any tenderness. I gave him a hypodermic injection of morphine, 3/8 grain, and atropine, 1/60 grain. Not having eased him in an hour, I gave him 1/4 grain, and in another hour another 1/4 grain. Besides, I applied several dry cups. I left 5/8 grain of morphine, all I had, to be given if pain returned. This was given during the night.

I returned next morning at ten, and found Mr. C. suffering greatly again. I had sharpened my scarifier, and got ready to abstract blood. Having no regular cupping-glasses, I used small tumblers and wine-glasses. I

commenced below the crest of the ilium, and followed the sciatic down the posterior part of the thigh, applying six small tumblers and two wine-glasses, and on the calf I applied one large and one smaller glass.

After dry cupping for five or six minutes, distending and paralyzing the capillaries, I scarified deeply, and succeeded in drawing about ten ounces of blood. I then wrapped my patient up in thick woollen blankets, and gave him 3 ounces of whiskey, and left him for an hour. As in my own case, he began to get ease as soon as the blood began to flow, and when I got through cupping, he felt only a slight pain in the outside of the foot. When I returned he was enjoying his pipe, and was as happy as could be. I ordered him to keep between blankets, not to move for anything, and to use a bed-pan when his bowels moved, so as not to put the nerve on the stretch in sitting on the ordinary chamber. I also gave him the following prescription :

℞ Extract. gelsem. fluid., fʒii;
Potass. iodidi, ʒiii;
Potass. acetatis, ʒvi;
Aquæ, q.s. ad ℥vi. M.

Sig.—Two teaspoonfuls four times a day in half a glass of water.

He was kept a week in bed, and then allowed to get up. He suffered from some pain on the outside of the ankle for three days after cupping. His wife applied mustard, which was left on till it produced some vesication. This removed the pain ; since then there has been no more pain.

I have been induced to write this article for three reasons,—first, I know of no standard work which says a word about this method, and I have not seen anything concerning it in any of the journals which I have taken for twenty years ; second, in well-selected cases, and taken before permanent pathological changes occur, I believe there is no remedy that will act so quickly both to relieve the patient and to bring about so rapidly a subsidence in the inflammatory process ; and, thirdly, it is the most rational treatment and the most prompt remedy we have in the purely inflammatory types of the disease. When one cupping does not have the desired effect, I do not hesitate to repeat it once or even twice. The patient should be kept in bed, between blankets, and perspiration encouraged. The limb should be kept absolutely quiet, but I do not believe in the straight splint. I have suffered many times with the disease since 1872, but never very severely, and my experience is that the easiest position of the limb is to have the thigh slightly and the leg considerably flexed. Under these circumstances the patient can lie on his back or either side, which is a great comfort to him. The use of adjuvants may be necessary or advisable, such as circumstances may suggest. I would especially advise the use of morphine and atropine for a few days if there is any remaining pain after cupping.

Before discharging the patient he should be fully advised to be careful in the future not to strain the sciatic or expose himself to "catching cold."

OCULAR MANIFESTATIONS IN GENERAL DISEASE—A GROUP OF ILLUSTRATIVE CASES AND THEIR TREATMENT.

By S. D. Risley, M.D.*

THE rapid growth of specialism in medicine, which in some sense characterizes the last quarter of a century, has introduced the possible danger of neglecting the adequate study of systemic disorders and general therapeutics, the tendency upon the part of the special practitioner being to confine the attention too exclusively to the local manifestation of disease and to local measures for its relief.

The etiology of localized inflammations is by no means always clear to the mind of the most studious and experienced physician. Indeed, in a large group of such inflammations, when all has been done to reach some definite conclusion regarding their nature, he is forced to institute some method of treatment based upon one of several hypotheses, each of which he may be compelled to hunt down in turn by therapeutic means, the definite diagnosis, based largely on therapeutic results, being recorded only at the close of the case.

It is probable that no organ of the body is more liable than the eye to suffer from the localized display of the general dyscrasia. It is not only liable to direct attacks of inflammation, involving its various tissues and appendages, which are obviously due to some well-defined cause,—*e.g.*, rheumatism, malaria, struma, syphilis, etc.,—but, in addi-

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tion, all forms of disturbance affecting its highly-organized structures are liable to be masked, modified, or more or less definitely controlled by the presence of some constitutional malady, the existence of which may not be suspected, or, if suspected, is so well concealed, or so doubtfully manifested, as to baffle the most astute practitioner. It is not the purpose in this paper to discuss these complications in all their important bearings, but to present a small clinical group of typical cases to illustrate the importance of general therapeutics in the treatment of certain forms of eye-disease complicating a general diathesis. This has been recently forcibly demonstrated for malarial disease, in an exhaustive study of "Ocular Complications of Malaria," by Dr. G. E. de Schweinitz.*

It is equally important to recognize the complications due to the lithæmic and other diatheses. It is this close relation existing between eye-disease and the various dyscrasias which so frequently complicates the work of the ophthalmic surgeon, often removing even cases of refractive error, and defects of ocular balance from the realm of the physiologist or oculist, and placing them squarely within the domain of the therapeutist.

CASE I.—*Paresis of the External Rectus of Rheumatic Origin.*—Mr. H. retired in his usual health, but, on rising in the morning, found that he had "caught cold." The muscles of his neck were stiff and sore. He felt "dull," but ate his breakfast, and started for his place of business as usual. He found difficulty in walking, which he soon discovered was due to his confused vision.

I found him with a paresis of his right external rectus muscle, and his defective vision was due to the resulting diplopia.

A purge and Turkish bath removed in a few hours both the "stiff neck" and the ocular trouble. He had suffered from rheumatism of his rectus muscle.

CASE II.—*Rheumatic Conjunctivitis.*—Mrs. X., the wife of a very busy physician, consulted me, September, 1885, for a red and troublesome left eye, which had not responded to astringents. It presented the usual features of conjunctival catarrh. The bulbar conjunctiva was deeply injected, the caruncles were red and swollen, the retro-tarsal folds were thickened, and the tarsal conjunctiva opaque. There was more photophobia and lachrymation, and less mucous discharge than is usual for catarrhal conjunctivitis of such severity as was here presented. Its real nature, however, was not suspected.

She received a saturated solution of boracic acid, to be freely used, as an eye-wash. The lids were everted at the office, and a one-grain solution of silver nitrate was thoroughly applied.

The treatment was varied from time to time, but in ten days there had been no favorable response. The eye was worse in every way. The conjunctival thickening had increased, the cornea was steamy and in places denuded of its epithelium. The ball had become extremely tender to the touch. The tension was normal. The photophobia increased, and the eye had become painful. The pupil dilated regularly and to large medium under atropine. The suffering was so great that she was confined to her room. All measures for her relief failed, and the prognosis seemed exceedingly grave. The most painstaking study threw no light upon the cause of this aggravating malady, and we were quite in despair. Nothing, it seemed, which promised any relief had remained untried.

At the end of her second week, I left her, late in the evening, in this apparently hopeless condition. The following morning I found a flood of light in the room, my patient smiling, and, so far as the eye was concerned, comparatively comfortable. The pain, photophobia, and lachrymation had disappeared, and the ball was no longer tender to palpation. The bulbar injection was much less, and in twelve hours more was quite gone. The corneal epithelium was rapidly replaced.

The explanation of this most remarkable change was found in a pronounced attack of articular rheumatism, involving the left knee, which was red, painful, and swollen. The eye went on to a rapid and complete recovery. It had not occurred to either her husband or myself that the eye-trouble was rheumatic.

CASE III.—*Rheumatic Asthenopia.*—Miss C., a school-teacher, 47 years of age, had for several years been unable to use her eyes without causing great aggravation of an almost constant, dull, periorbital, and ocular pain, which extended to the occiput. There were no marked external appearances of disease, but the balls were tender to palpation; at times the slightest pressure over the closed lids caused decided pain. Tension was normal.

She had hypermetropic astigmatism, which had been corrected three times by skilful col-

* *Medical News*, June 7, 1890, Philadelphia.

leagues. The correcting glasses were worn constantly, but did not afford relief. There was no anomaly of the ocular muscles.

She was pallid, overworked, sedentary in her habits, and had the anxious care of an aged invalid mother. There was pharyngo-tubal catarrh and tinnitus, which greatly added to her discomfort. She was subject to frequent attacks of acute follicular pharyngitis.

The menopause had been successfully passed, but she still suffered at intervals with flushes of heat and perspiration. Vision was normal in each eye, but there was no range of accommodation. The presbyopia was as absolute as at sixty years of age. The specific gravity of the urine was high, but there was no sugar or albumin.

The pharyngo-tubal catarrh was carefully treated, with much relief, but was subject to frequent relapse. She was sent to the gymnasium; daily out-of-door exercise was enjoined; her diet and hours for meals and secretions were carefully regulated, and alterative tonics were administered.

Her general health improved, and her eyes grew better, but were subject to frequent relapses of pain, accompanied by occipital headache, and utter inability to use them. At such times the muscular balance was disturbed but irregularly, the balls were tender to the touch and felt "sore" under movements. The choroid was woolly and the optic disk too capillary.

During an unusually severe attack, a year or more after her first visit, I suggested the possible gouty or rheumatic nature of her trouble, mapped out her diet-list, and gave her a mixture of iodide of potassium, guaiacum, and colchicum. She went home, took a dose of the mixture after supper, and retired as usual, but was awakened in the night by pain in her heel, so violent as to make it necessary to send for her physician, Dr. Hearn, who pronounced it a "rheumatoid" attack. She was confined to her bed and room many days, during which time she read constantly without the slightest discomfort to her eyes, which she had not been able to do for several years.

The nature of her trouble being understood, the violent attacks have been warded off by general therapeutic measures. She has learned that exercise in the open air, a trip to the country or sea-side, careful avoidance of constipation, and of a too largely albuminous diet, will either prevent entirely or ward off the tenderness of her eyeballs and her pharyngeal trouble.

CASE IV.—*Rheumatic Iritis.*—Mr. S., aged 50, a gentleman of leisure, but who spent much time in the study of music and in painting, in both of which he excelled, consulted me for a smart attack of iritis.

He suffered intensely, but rapidly recovered from the primary attack. He passed an evening at a concert too early in his convalescence, and suffered a relapse, which, after six weeks, had thoroughly baffled every measure adopted for his relief.

The picture presented was that of a violent rheumatic iritis, of a most rebellious type. He was in condition bordering on despair. Nothing gave him more than temporary relief. His general regimen had been carefully directed, and all local and general measures had been tried again and again, including the salicylate of sodium, which upset his stomach and caused great depression. At my early morning visit I found him greatly exhausted, after a night of suffering, occupying his luxurious bachelor's quarters, a picture of suffering and despair. I prescribed 5-grain compound tablets of salicylate of cinchonidia. He swallowed two of them—10 grains—at once, and was directed to take one every hour until three others were taken. The first dose was taken at 9 A.M. I saw him again at 2 P.M., and found him at his piano, free from pain, a flood of light in the room. The suddenness of the change was surprising. He said the pain left before an hour had transpired after the first dose of the salicylate had been taken. In twenty-four hours the redness was largely gone from the eye, and he made a speedy and complete recovery, and has never had a relapse.

In each of these cases the local measures adopted for their relief were utterly futile, so far as could be seen, since no progress towards recovery from the eye-symptoms was made until the disease had shifted to another part, as in Case II., or until, as in Case III., the proper therapeutic means was adopted. It should be noted that Case IV. had from the first been regarded as one of rheumatic iritis, but had stubbornly resisted all treatment, local and general, directed with its probable rheumatic character in mind.

CASE V.—*Multiple Retinal Hemorrhages, recurring periodically, probably due to Malarial Poisoning.*—Mrs. T., aged 42, consulted me, November 5, 1888, suffering from severe fronto-occipital pain and failing vision in the left eye. She was wearing compound glasses, ordered by her local oculist, who had also

discovered the recurring retinal hemorrhages, and had given her a grave prognosis. She related that the hemorrhage had first been discovered, after a violent headache, in August, 1888, which came on at the sea-shore. There had been several recurrences. She was exceedingly despondent, under the opinion she had received as to the threatening nature of her trouble.

On the right side vision was normal with her correcting glasses, and the eye was healthy. In the left eye vision was one-third, and the ophthalmoscope revealed numerous small irregularly-shaped, yellowish-white spots, distributed over the eye-ground, probably marking the sight of former hemorrhages, and a partially-absorbed blood-clot lying directly in the macula.

The patient was to all appearances in perfect health. The urine at no time revealed either albumin, tube casts, or sugar. Her physician reported retroversion and endometritis. There were no indications of the approaching menopause.

The chlorides of iron, mercury, and arsenic were prescribed for internal administration, and homatropine locally. Smoked glasses were to be worn when out of doors or in bright gas-light.

Two days later she returned mentally depressed, feeling badly. The lids were puffy, and there was a sense of fulness in the left eye and post-ocular pain. There were several flame-like hemorrhages in the retina, and the entire eye-ground flannel red,—$V = \frac{6}{xxx}, T + (?)$.

The homatropine was omitted and a weak eserine solution substituted.

In three days, November 10, she reported feeling much better. The improvement continued until December 1, when there was a recurrence of all the symptoms, a new crop of hemorrhages in the left eye, and a small one above the macula in the right.

Her home was in a district known to be malarious. The probable malarial origin of her trouble was suggested, but met with a most hostile denial. She had but recently built a beautiful and costly home, and was extremely loath to admit the probability of malarial influences surrounding it.

She consented only under protest to add antiperiodic doses of quinine to her arsenical mixture, and returned to her home, strongly imbued with the improbability of the correctness of my diagnosis; but the same evening, while in church, she had a chill, which proved to be the cold stage of a typical intermittent paroxysm. This was repeated on the fourteenth day, and unfortunately produced a new crop of retinal hemorrhages in both eyes. Thoroughly convinced now of the malarial character of her trouble, she willingly took antiperiodic doses of quinine, and consented to remain a few weeks at the sea-side.

She returned much improved in general health, and in the mean time the retinal hemorrhages had disappeared. She was given Warburg's tincture, and returned to her home. The headache had disappeared and vision markedly improved. There were occasional recurrences of pain, and at long intervals small extravasations in one or both eyes until the following June. The summer was passed in the mountains. The arsenical mixtures, alternating with quinine or Warburg's tincture, were taken with more or less regularity. In October there had been no recurrence of her symptoms; her health was fairly good, and she passed from under observation. On November 19, 1891, while sitting in church, where the cold stage of the intermittent had come on in 1888, she had an attack of apoplexy and died comatose on the fourth day. No post-mortem was allowed.

It is to be regretted that her life could not have been passed in some more healthful locality after the nature of her disease had become manifest. The case is painfully significant in its final outcome as to one of the possible causes of cerebral hemorrhage in malarial districts. As long as the patient remained from home, or would take considerable doses of quinine regularly, her health improved, and the ocular hemorrhages ceased to recur.

Case VI.—Miss G., aged 17, was first seen September, 1889, in consultation with Dr. J. H. Pugh, of Burlington, N. J. Her home was on the banks of the Susquehanna. She had ocular and periorbital pains which radiated to vertex and occiput. The pain was worse on the right side, and dated back to the preceding March. She had never had intermittent fever.

O. D. $V = \frac{6}{ix}$, O. S. $V = \frac{6}{vi}$. She had a refractive error, determined under a mydriatic, corrected by $+ 1.25 \bigcirc + .50$ c. axis vertical in each eye. In O. D. there was a granular patch of choroiditis, situated above the nerve, irregular in outline, about the size of the optic disk, surrounded by a larger area of choroidal disturbance, which faded gradually into the surrounding nearly healthy

eye-ground. Throughout this area the details were veiled or fogged, while elsewhere the eye-ground was clearly seen. She received a mydriatic and smoked glasses, and internally potassium iodide and bromide, of each 5 grains thrice daily.

October 8.—The granular patch in the choroid was more definitely outlined; the fogginess of the contiguous vitreous had increased, but through it could be seen a flame-shaped hemorrhage at its lower margin.

Between this date and the following April she suffered repeated recurrences of small hemorrhages around the margins of this choroidal patch, attended with increased haziness of the vitreous, which would slowly clear up and the blood absorb, but each time making new encroachment upon the surrounding choroid until there was a large atrophic patch lying in the upper eye-ground, but still separated from the upper margin of the nerve by a disk's width or more.

Her visits were so timed that the exact interval between these successive extravasations could not be determined. She had never had intermittent fever, and rather resented any suggestion of malarial poisoning and was much opposed to taking quinine. She, however, received a pill of pyrophosphate of iron, arsenious acid, and quinine. Under this and the more favorable influences of advanced spring and summer, part of which was passed at the sea-shore, the eye rapidly improved, vision became normal, and in October, 1890, she was allowed to return to school, from which she had been detained for a year. The school was, however, situated in a district quite as malarious as her home.

December 13.—She reported having had no trouble with her eyes, $V = \frac{6}{vi}$ in each. A large choroidal scar in O. D., but both eyes well and general health good.

One week later, December 20, she was called home by the serious, puerperal illness of a sister. During the first night at home, and in the midst of the trials surrounding the family, she was attacked with excruciating left hemicrania, which "drove her frantic." The following morning vision in O. S. was defective. Then followed the sister's death and the depressing influence of grief. The menstrual period was passed without flow. The following January 15, twenty-three days after the hemicrania, she was seen in consultation with Dr. Pugh.

She was pallid, had a capricious appetite, and slept badly,—O. D. $V = \frac{6}{vi}$, O. S. $V = \frac{6}{xii}$. The temporal field of the left eye was blind, the line of vision, however, being inclined 15° from the vertical. She had no pain, and complained only of the dim vision with the left eye. The optic nerve was completely hidden by a grayish-white infiltration of retina, which also obscured the retinal circulation far back into the periphery of the eye-ground. The summit of the swollen optic nerve, its upper and inner quadrant, could be seen with + 3 D. There was a group of small striated hemorrhages below the nerve, and near the macula a D-shaped hemorrhage, bright red, with sharp outlines, and about half the usual diameter of the optic disk. Urine, specific gravity 1030. No sugar; no albumin.

She was sent to bed in a shaded room, two Swedish leeches applied to the left temple, and syrup of hydriodic acid and corrosive sublimate f℥i and grain $\frac{1}{48}$ were administered. In four days vision improved to $\frac{6}{ix}$ in the affected eye, but there was no notable change in the eye-ground or field of vision, and she was allowed to get up.

On January 26, V had sunk to $\frac{6}{xii}$. Again she had some headache, and there was an additional hemorrhage over the surface of the optic nerve, and only a very foggy image of the eye-ground could be had.

She thought the relapse was due to exposure to the snow-light. Leeches were again applied and the dose of her medicine increased to f℥ii and grain $\frac{1}{24}$. February 2, menstrual flow came on normally. The eye steadily improved until February 14, O. D. V $\frac{6}{vi}$, O. S. V $\frac{6}{vii\frac{1}{2}}$, many letters in $\frac{6}{vi}$. The hemorrhages had absorbed and the swelling of retina and nerve had diminished.

On the night of February 17 she had violent headache with high fever. The following day, at noon, temperature 101, pulse 110. She was seen with Dr. Pugh as consultant, and the attack was regarded as an intermittent or possibly remittent paroxysm. Antiperiodic doses of quinine, 15 grains daily, were prescribed. The attack rapidly subsided, but a large plaque-like hemorrhage was found in the *right eye*, lying above the optic nerve, and almost filling the space between the lower border of the choroidal patch and the upper border of the nerve. The quinine was continued in smaller doses, and she returned to the hydriodic acid mixture. On seventh day

from the attack of headache she had a new hemorrhage in O. S. with sense of increased tension.

A sample of her blood was now secured and kindly examined for me by Dr. Joseph Leidy, Jr., who reported the presence of the corpuscles of Laveran, notwithstanding the fact that in two days she had taken thirty grains of quinine only a week before, and four grains daily up to the time of the examination. The dose was then increased to twenty grains daily for two days, and then continued at ten grains daily for two weeks, when ascending doses of arsenic were substituted. Under this treatment a rapid and gratifying change was observed. The hemorrhages absorbed, the swelling of nerve and retina subsided, and vision rose to $\frac{6}{vi}$ in each eye.

By March 1 the borders of the nerve could be distinguished, the swelling at the upper and inner side being last to subside. The field of vision showed a corresponding change. The upper temporal quadrant gradually improved to normal perception, but the lower temporal quadrant remained totally blind. March 15 the swelling had disappeared, leaving only a hazy retina veiling slightly the details of the eye-ground. The chlorides of iron, arsenic, and mercury were now prescribed, and *five grains* of quinine to be taken each morning at breakfast. The ophthalmoscopic picture approximated that of health more nearly day by day, the patient increased in flesh, and seemed in perfect health. In November, 1891, health good, $V = \frac{6}{vi}$ each eye, the lower temporal field in O. S. blind, and the ophthalmoscope showed the upper nasal quadrant of the nerve green and totally atrophic. The long pressure upon the retinal fibres at this part of the nerve had doubtless caused their permanent atrophy.

In this case it may be urged that the condition of the eye-ground in O. S. was produced by the sudden shock caused by the sister's death, or was in some way associated with her menstrual derangement. In reply, the history of the right eye may be urged in rebuttal of such a view, and with still more force the fact that the hemorrhages in O. S. continued to recur after the menstrual function was normally performed. The presence of the corpuscles of Laveran, the rapid subsidence of the superficial neuritis under the administration of quinine and arsenic, the periodical recurrence of the hemorrhages at approximately multiples of seven days, and her life-long residence in a well-known malarious region leave little room to doubt the correctness of the diagnosis of the malarial origin of her trouble. The permanent lesion of the optic nerve is not the least interesting feature of the clinical picture.

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*THE SYRUP OF IRON CHLORIDE.**

By G. M. Weld, M.D., New York.

I WISH to gratefully express my convictions that no small share of any success which I may have met with in my experiments is attributable to the circumstance of my having had the assistance of one or two distinguished chemists and the friendly encouragement of a goodly number of physicians residing in New York. Having been led by special circumstances, some seven years ago, to begin a series of experiments, I found it impossible to continue without sacrificing a large portion of time usually allotted to repose, at no inconsiderable cost of both health and spirits. The experiments have been associated with certain other disadvantages, which accounts for the imperfection of some of the first productions. But from the testimony of several physicians who have lately employed the preparation in their practice, and the opinions of other physicians who have not as yet tested it, but intend doing so in the near future, I am led to believe that I have finally succeeded in changing an old reliable preparation of iron into what may be considered a new compound, the merits of which are worthy the thoughtful consideration of the medical and dental professions.

Whatever may be thought of the SYRUP OF IRON CHLORIDE, I wish to observe just here that the experiments have been conducted in a grave and earnest spirit, my only aim having been to produce a compound of the chloride which could be presented in a potent and permanent form (not emasculated), easily assimilated, and accompanied with all the virility of the *tincture*, without its objectionable features.

For a proper understanding of the subject (as the SYRUP OF IRON CHLORIDE is nothing more nor less than the tincture of the chloride of iron slightly modified), permit me to introduce the same by first making a few remarks on the tincture.

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* Read before the Odontological Society of Pennsylvania, January 9, 1892.

The tincture of the chloride of iron is made from the liquor ferri chloridi, and contains 37.8 per cent. of the dry chloride. In making the tincture of the chloride, 35 parts of the liquor are added to 65 parts of alcohol. Attfield says "that the liquor which is used in making the tincture contains much free acid, which, it is claimed by some authorities, is necessary to prevent the precipitation of the basic salts of iron, and this free acid contained in the tincture constitutes one of the objections which has been raised against its use, because of its destructive energy upon the enamel of the teeth."

Before an audience, composed chiefly of dentists and physicians, it would seem to be almost the triteness of an observation to comment on the pernicious influence of free hydrochloric acid upon the structure of the teeth; but, as we judge everything by contrast, and as the SYRUP OF IRON CHLORIDE is characterized by an absence of this one particular objectionable feature, I trust you will pardon me when I allude to the observations and conclusions of one or two other gentlemen who have experimented on the subject.

The results of the experiments of Dr. Smith,* of Edinburgh, Scotland, are interesting to both the physician and dentist. Dr. Smith experimented with eight of the compounds of iron which, at the time the experiments were made, were most generally used as remedial agents. These were the saccharated carbonate of iron, twenty grains to an ounce of water; carbonate of iron in the same proportions; syrup of the phosphate combined; the syrup of the iodide of iron and water equal parts; the citrate of quinine and iron; the wine of iron; the sulphate; and the tincture of the chloride of iron. On examining the respective solutions after twenty-hours the teeth were found unaltered in those of the carbonate, saccharated carbonate, phosphate, iodide, citrate, and the sulphate.

In the solution of the wine of iron, the liquid itself was somewhat turbid, the teeth, however, appearing to be untouched. In that of the chloride of iron, a turbid sediment filled the bottom of the bottle and covered up the teeth from view; the fangs of the teeth were somewhat soft and flexible, and the enamel easily scraped down. The sediment under the microscope presented an amorphous appearance. In conclusion, Dr. Smith further says that, of his experiments, it would appear that certain preparations of iron, when directly applied, do exercise a powerful effect on the substance of the teeth; and the ratio of the effects obtained would seem to prove that, of all the preparations employed in these, that of the tincture of the chloride of iron acts more powerfully, the sulphate of iron next, and next to that again, although in comparison very immaterially, the wine of iron, the other preparations of iron appearing to be inert.

At a somewhat later period, Dr. J. H. McQuillen, of Philadelphia, in speaking of the effect of this preparation of iron on the teeth, stated, in an article published in the *Dental Cosmos*,† vol. viii. p. 345, that "a young lady, whose teeth, originally of excellent material, are now in the most dilapidated condition, informs me that she has taken the tincture of the muriate of iron almost daily during the last year.

"In her case not only the affinity between the hydrochloric or muriatic acid and the lime in the teeth has been fully demonstrated, but in addition the impropriety of an indiscriminate use of that valuable remedy.

"Employed, as this agent sometimes is, for a week or weeks, with the direction to take 15 drops every two hours in a little water, without any caution or corrective against its deleterious influence upon the teeth, it is no wonder that organs which are so important to health and appearance as the teeth should have their integrity seriously, if not irremediably, affected."

In connection with the direct action of the tincture upon the enamel, the experience of a physician of New York, Dr. E. M. Cameron, is worthy of more than a passing notice. Dr. Cameron, while visiting a sea-side resort a few summers ago, was called upon by a lady suffering with intense pain to have the right lower molar extracted. In the absence of a dentist, he succeeded, he said, in extracting the tooth. He was summoned again a few hours after to see his patient, whom he found suffering with an excessive hemorrhage, due to the extraction. Not having the usual styptic,—the tersulphate of iron,—he applied upon a pledget of cotton a small quantity of the tincture of the chloride. On calling upon the lady the following day, he was welcomed with the exclamation, "Doctor, you have stopped the hemorrhage, but you have destroyed two teeth!" On examining the adjacent teeth, he discovered that the enamel

* *Edinburgh Medical Journal*, 1886, vol. ii. p. 631.

† "The Deleterious Effects of the Muriate of Iron on the Teeth."

on the anterior and buccal surface of the second molar, and on the posterior and buccal surface of the second bicuspid was softened to such an extent that it could easily be scrapped off with the finger-nail. The case made such an impression on his mind that ever after, when he found it necessary to administer the tincture of the chloride of iron, he said he did so with a considerable degree of reluctance, and invariably cautioned his patients regarding its use, at the same time suggesting such precautions as he thought would best counteract its destructive influence.

One of the precautions generally suggested by the medical practitioner is to direct the patient to *dilute with water*. But chemical observation shows that *water* increases the destructive energy of the tincture of the chloride of iron upon the structure of the teeth more than any other fluid. As an illustration, the effect of adding water to a simple solution of the chloride of iron, *devoid of free acid*, is to give us basic salts of iron and the separation of free hydrochloric acid. If a freshly-extracted living tooth be immersed in the officinal tincture of the chloride,—say, for a period of twenty-four hours,—we shall find that the enamel, the most susceptible portion of the tooth, is not injured in the slightest degree; but, if the same tooth be immersed in the tincture diluted with water, in proportion of 1 to 8,—*i.e.*, 1 part of the tincture and 8 parts of water,—we shall find that the enamel is materially injured within a period of one minute. It is not, therefore, entirely a matter of the strength of the acid that is likely to injure the teeth, but a matter of construction or solubility. To illustrate still further: When a piece of zinc is immersed in strong sulphuric acid (H_2SO_4), it will be observed that the acid has no effect upon the structure of the zinc; but, if a little water be added to the acid, we find that the zinc is immediately attacked by the acid. The zinc in the strong sulphuric acid is protected from destruction in the same manner that the enamel of the tooth which is immersed in the strong tincture of chloride of iron is protected,—viz., the surface is blocked up with the basic iron salts, insoluble in alcohol, which prevents chemical action. In case of the zinc, it is the sulphate of zinc resulting from the first action, which is insoluble in the concentrated acid, that forms a protecting coat over the surface of the zinc. The addition of water dissolves this protecting sulphate and renders further chemical action possible. In the case of a tooth immersed in the pure tincture of the chloride of iron, a similar action takes place,—viz., the oxide of iron first formed protects the tooth from immediate chemical action, owing to its compact adherence to its surface. As additional testimony relating to the injurious action of the tincture of the chloride of iron upon the teeth, I might add that almost all authorities on therapeutics and materia medica have expressly laid down the fact that the acid and astringent preparations of iron act on the teeth with considerable energy.

It seems unnecessary, therefore, to cite any more cases, either for the purpose of showing the destructive tendency of the above-mentioned preparation of iron on the enamel of the teeth, or that physicians and dentists are ignorant of such a condition of affairs. It is now, I believe, generally admitted by almost every one who, I might add, has had an opportunity of observing the effects, that the tincture of the chloride of iron, although passing transiently through the mouth and over the surfaces of the teeth, nevertheless exerts a most powerful and pernicious action on their structure.

Notwithstanding the objectionable features of the tincture of the chloride of iron,—viz., its peculiar and disgusting taste, its liability in many cases to excite nausea and vomiting, and its extremely acid and astringent properties,—it is frequently employed by physicians not only in the treatment of anæmia, but also in large doses in the treatment of erysipelas, neuralgia, diphtheria, epilepsy, acute rheumatism, and other disorders which might be mentioned. It acts also as a diuretic; even in ordinary anæmia many authorities prefer it to any other preparation, claiming that its effects are shown much more quickly, and that it seems to act more satisfactorily. Almost all agree that it possesses special virtues, either constitutional or local, which render it useful in the above-mentioned disorders. These peculiar properties (especially the diuretic effect) are ascribed by some to a peculiar ethereal compound, resulting from the mixture of the *liquor ferri chloridi* and the alcohol used in making the tincture, to which compound its odor is due.

As I stated in the beginning of this paper, the *syrup of iron chloride* is simply the tincture of the chloride of iron in a slightly modified form, a sufficient quantity of *alkali* having been added to counteract the *free hydrochloric acid* and a small quantity of the syrup of gaultheria (which, it is claimed, in certain disor-

ders has a therapeutic value) to render it more palatable. In other words, the excess of acid over and above that necessary to form a perchloride of iron has been eliminated. The preparation is, therefore, acid in reaction, but the relative properties of the acid and iron have been adjusted so delicately that, although sufficiently acid to prevent the precipitation of the basic salts of iron, it is not enough acid to injure the enamel of the teeth. And it is to be noted that, while the teeth are protected from injury, as soon as the preparation passes through the mouth and reaches the stomach it meets with more hydrochloric acid,* and is likely returned again to its original condition, or nearly as it was in the original tincture of the chloride;† accordingly, it may be said that the therapeutical value of the syrup is identical with that of the tincture. Moreover, it is claimed that the syrup as a restorative agent is easily assimilated, and more likely to be tolerated by the mucous membrane of weak stomachs than the old form of the chloride, and is less harmful under prolonged use.

It is not claimed that all of the objectionable features of the tincture have been removed. For instance, the *syrup* possesses the same special and styptic qualities as that of the tincture, and it necessarily follows that there will be a corresponding physiological effect produced on the mucous membrane of the bowels. It will be necessary, therefore, for the physician (as when using the tincture) to pay proper attention to this particular functional disorder.

It has been observed by Dr. Dana, of New York, that when administering the *syrup of iron chloride* to children (when tonic remedies and supporting measures of treatment were indicated) that the tongue of the patient was less likely to be discolored than when the tincture was employed, and he has been enabled to more clearly define the presence of sordes. It is not claimed, however, that the *syrup* will not discolor the teeth. In reference to the latter, the same may be said of soft-boiled eggs and the various kinds of salad dressings; but in all cases, after the discoloration has been removed, the enamel and structure of the teeth are found to be intact.

The following cases have been reported to me by physicians who have employed the preparation in their practice:

CASE I.—By Dr. Cyrus Edson, Chief Inspector, Board of Health, New York City.—Mrs. P., aged 38 years, came to me suffering from a severe attack of anæmia and sciatica. She had been troubled with sciatic pains for four months previously, and, although she had been under treatment by three other physicians, she had obtained no relief.

The etiology of the sciatica, as far as could be ascertained, was the history of severe grief, due to the loss of her son. I gave her an aperient (cascara sagrada) morning and evening, also ordered Weld's syrup of chloride of iron, to be taken three times a day, after meals, in 4-drachm doses.

It is now one month since the last consultation. All pain has completely disappeared, and her blood is in excellent condition.

CASE II.—Mr. C., aged 37 years; physical condition about the same as previous case, though of much longer standing.

He has been troubled with sciatica, associated with anæmia, for about three years, but it is only within the last year that the pain has been continuous.

I made use of subcutaneous injections of *aqua pura* along the course of the sciatic nerve, and also to improve the condition of the blood, Weld's syrup of iron.

The patient has been under my treatment for about a month, and complains now only of slight intermittent pain during the night. Physical appearance much improved.

CASE III.—G. C., a child, 8 years old, resident in New York City, had a very bad attack of malarial fever, followed by *anæmia*. I put him on Weld's syrup of iron, with result of a decided amelioration of all the symptoms within two weeks.

In all the above cases the patients experienced no trouble in taking the preparation, and the teeth suffered no deleterious action.

As far as my experience extends, I can say that Weld's preparation contains all the advantages, without any of the disadvantages, of the officinal tinctura ferri chloridi.

CASE IV.—By Dr. H. B. Bayles, Sanitary Inspector, Board of Health, Brooklyn, N. Y.—Mr. B.; was taken with a chill on September 4, 1891, with slight elevation of temperature. The condition of moderate fever continued for several days, and developed, as was expected, into what was supposed to be a mild

* It is supposed that hydrochloric acid is produced in the stomach by a reaction between the chloride of sodium and lactic acid.

† See Professor Elliott's remarks before the New York Odontological Society (*International Dental Journal*, August, 1891, p. 554.

case of typhoid fever. In due time the eruptions occurred, and, aside from general debility, he did not complain of any very annoying symptoms; no profuse diarrhœa; in fact, being what might be termed comfortably sick.

This state of affairs continued till the sixteenth day of his illness, when he was attacked with epistaxis (not profuse); the next day there was extensive purpuric spots over the entire body, hemorrhages from the tongue and gums, and copious hemorrhages from the bladder. The temperature remained at 100.5° F., the pulse at 124, the patient completely exsanguinated and in a critical condition. This state of affairs continued about one week; the treatment consisted of stimulants, heart tonics, and tinctura ferri chloridi; the iron was given in moderate doses and frequently; but the stomach, heretofore manageable, became rebellious, and rejected it. When the old reliable preparation of iron had to be abandoned, I considered my mainstay gone. Having the same day received a large bottle of the modified tincture of iron, prepared by Parke, Davis & Co., after the formula of Dr. G. W. Weld, of New York City, I immediately gave the same, commencing with one tablespoonful, and increasing to three tablespoonfuls, every two hours. This preparation was *tolerated by the stomach*, gave rise to no nausea, and was taken continuously in varying doses for several weeks. I had the extreme satisfaction of seeing my patient restored to perfect health, and to learn that the old reliable *tinctura ferri chloridi* had been so modified that its greatest drawback had been removed and that it was rendered an agreeable preparation.

CASE V.—By Dr. A. H. Dana, New York City.—Louis L. had been suffering from typho-remittent fever for a period of five weeks. As usual in such cases, he was very much debilitated and in an anæmic condition. His stomach at the end of the fourth week was extremely irritable, and he was unable to retain anything in the way of food or medicine. Iron in some form was indicated. I employed a number of preparations without success. Having had my attention drawn to the SYRUP OF IRON CHLORIDE, I immediately prescribed it, giving him five tablespoonfuls each day. The effect was immediate: his nausea ceased, the digestive organs resumed their normal function, and he rapidly improved and regained his health.

I have since prescribed this preparation in three other cases with equally as gratifying results.

A CLAIM FOR THE PURE ORAL METHOD IN TRAINING DEAF-MUTES AND CORRECTING DEFECTIVE ARTICULATION IN A HEARING CHILD.

BY AMY STONE.

I WOULD like to call the attention of the readers of the GAZETTE to this short sketch of work done for some of our afflicted brothers, which I have called "A Claim for the Pure Oral Method in training Deaf-Mutes and correcting Defective Articulation in a Hearing Child." Of the deaf-mutes I shall speak first.

Years ago, when the world and science were young, when a child was born totally devoid of hearing, or when, through sickness or other cause, one became deaf and speech was forgotten, then he must be forever in utter silence. Nothing was done to alleviate his hard lot; he was allowed to grow up as one without mind, and the general feeling and impression was that he was indeed one of those hapless ones. The world rolled on, and science took a step forward in behalf of the deaf, and gave him the sign manual, which was a gain of inestimable value, opening for him an avenue to the mind, and helping him to thoughts and ideas, and to communication with those who had studied that system; but keeping him still shut off from the majority of his fellow-men. Year by year, however, the advance in this work has been going on, and now, for the deaf is speech, which all may understand, and lip-reading, whereby he may understand all. Let me quote, in proof that such is the case, some special cases from the work of Miss Emma Garrett, for many years teacher of the Pure Oral Method, latterly principal of the Pennsylvania Oral School for the Deaf at Scranton, Pa., and now bending all her energies towards the starting of an infant home for mutes before they are of school age, so that they may be trained in speech from the time in which a hearing child would begin to prattle his baby language, and so lose nothing of the valuable years from their lives.

She says, in a paper written for the Eleventh Convention of American Instructors of the Deaf, held at Berkeley, Cal., in 1886: "The following programme of closing exercises in Scranton School, held on June 26, 1885, may be of interest. The average time that the class taking part in exercises had been under instruction was six months.

Class gave date, day of week, month, and year; number of days in a week, in a year; names of months; names of spring, summer, fall, and winter months; names of last month, this month, and next month, *each pupil in class repeating answer in turn.* Class then went through a variety of exercises, such as telling the time from a clock face drawn upon the blackboard, counting up to one hundred, performing many actions, the directions being given by the lips. One pupil was asked, 'Do you like apples?' She replied, 'Yes, I like apples.' Another: 'Do you like coffee?' And she replied, 'No, I do not like coffee.'"

In another paper Miss Garrett says, "Gave prize of *Wide Awake* to Margaret Schmittlapp for improvement in language, United States history, geography, physiology, arithmetic, spelling, and writing. She is quite a ready talker, and has considerable facility in lip-reading. To Blanche Shrader, a napkin-ring, for willingness to use speech. She has learned in the ten months she has been under instruction in our school lip reading, language-writing, and spelling."

And so on through many others; but it would make this article too long were I to quote further. Sufficient has been told to show how successfully children who have lost their hearing may, by this system, be taught to use speech, even in the short space of six months.

And now one word in regard to that branch of the work in which I am specially interested, —the training of those whose speech alone is affected and whose hearing is unimpaired. Physicians often, and the general public occasionally, come across a child whose speech is perfectly unintelligible from some physical defect or nervous habit. To him, too, the pure oral method comes as a blessing, smoothing the tangles from his speech and straightening out his crooked tongue.

As a case in point, let me mention a little boy whom I know, unusually strong and robust, bright and intelligent, with a flowing, liquid language all his own. When, as quite a baby, he first began to speak in his peculiar way, he was supposed to be tongue-tied, and an operation was performed upon his tongue, with no beneficial effect. Then it was thought that he would outgrow that manner of speech, and gradually speak as other children do; but year by year went by, and he still remained unintelligible to every one but those who, being with him, had learned his language. At nine years of age "Tĭppo" stood alike for both Christmas and squirrel; "Tŏppo" was carry; "Lā" stood for both uncle and aunt; "Wŏŏney" was woman; "Lă," yes. "No" he always said perfectly, and I can recall no other word but his own baby title of "Bee" that he could so call. He usually spoke very rapidly, and would drop many syllables from a word, as "dĭppo" for difference, "lē" for read, etc. His patience in trying to make himself understood was wonderful, and his sad little "Ne er mī" (never mind) very pathetic after his many failures. Through the advice of Dr. Wharton Sinkler, instruction in the pure oral method was instituted. In that method there is a "syllable drill," which contains all the sounds of the English language, which drill is taught by sight and feeling. The little boy of whom I speak was drilled in this method for from two and a half to three years, for a year or more before a looking-glass, in which both his mouth and the mouth of his teacher could be seen. He began with the "syllable drill," going as quickly as possible to words, and from words to well and easily-turned sentences, as it had been found that often the sentences were as much involved as the words. After this system had been carried on for a time, it was found that he could speak correctly before the glass with his articulation teacher, then his ear, being accustomed to her voice, he would speak clearly and distinctly to her, watching her mouth constantly as he did so. Now, after years of instruction, he goes to a large school for boys, and is readily and perfectly understood by both teachers and scholars. Think of the life that child would have led had his guardians permitted him to grow up without special training. Children, who are often heartless little animals by nature, have very little patience with one another, and often ridicule unmercifully an affliction of this kind, leaving an ache in the poor, little heart, which bears already the burden of frequent misunderstandings, that often is unforgotten in years.

I know another little fellow (the son of a physician in Philadelphia) who could scarcely be induced to play with boys, because they laughed at him and mimicked his words. Fortunately, this child, too, is being trained, and will soon speak as his fellows. But I cannot sufficiently urge upon those whom it may interest and concern the importance of this special training for those afflicted in any manner in their speech. It saves them from untold dilemmas, often from danger, and

from that sting which we all dread, more perhaps than a greater evil,—the ridicule of our kind.

THE PATHOLOGY AND TREATMENT OF TETANUS, INCLUDING A SERIES OF INVESTIGATIONS IN REGARD TO THE MICRO-ORGANISM OF THE DISEASE AND THE INFLUENCE OF DISINFECTANT SUBSTANCES ON THE SAME.

A STUDY FROM THE PATHOLOGICAL LABORATORY OF THE JEFFERSON MEDICAL COLLEGE.*

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TETANUS is an acute infectious disease which follows traumatisms, and is due to a special micro-organism, the *bacillus tetani*. The disease is characterized by persistent rigidity of the muscles of the jaw (trismus), and frequently of the greater part of the voluntary muscular system, with paroxysms of tonic spasms, irregular temperature and pulse, the intelligence being preserved.

The disease has been classed as traumatic and idiopathic. From the present knowledge of the origin of the disease, possibly a better classification would be traumatic and simulated, as it is generally conceded that there must be some traumatism, no matter how trivial or how produced. Under the simulated class would be placed all cases now known as nervous, emotional, or psychical; in fact, all cases which do not follow traumatism.

As to the duration of tetanus, it is classed as acute and chronic. The acute lasting from a few minutes to several days; the chronic lasting from eight days to seven weeks; in which case a more favorable prognosis may be given.

As far as the writer is aware, no case of traumatic tetanus, accompanied by bacteriological research, has been reported in this country. Senn has reported the production of tetanus in an animal from a case of chronic tetanus, but does not state that any attempt at isolation of the bacillus was made.

Several investigators on the continent (Nicolaiev, Rosenbach, Flugge, Bonomi, Beumer, Eiselsberg, Giordano, Ohlmüller, Kitasato, Belfanti, Pescarolo, and others) have made more or less complete studies of cases, but the present status of the bacillus of Nicolaiev has been reached by the combined work of at least one dozen investigators.

In this country no reports other than the one cited have been published. The writer is aware that a most complete investigation was made at the Johns Hopkins Hospital by Welch, Abbott, and others, as to the exogenous origin of the disease, but there has been no published report. The report of Professor Park, of Buffalo, which he read at the College of Physicians in Philadelphia, showed the bacillus of tetanus, with which he was able to produce the disease in animals, but did not state that a pure culture was again obtained from the animal.

The attempts made at isolation and pure cultivation have been almost entirely futile, and the inoculation experiments made have been with impure cultures, contaminated with cocci and a smaller bacillus; a greater number of the experiments were made by inoculations from different kinds of earth and a very few were made from traumatic cases.

In the laboratory reports made by Park, of Buffalo, and Charcot and Belfanti, of Paris, they claimed to have procured pure cultures of the bacillus of tetanus.

In August, of last year, the writer began these investigations, and at that time our knowledge of the disease was fragmentary, made up of the combined investigations of Continental observers, to be referred to later on. These observations were, many of them, contradictory and confusing, and the scientific world recognized the chaotic condition of the study of this most fatal disease. Although the date of the investigations made by Belfanti and Pescarolo in Charcot's laboratory is not given, it is to be assumed that they began much earlier than the writer, but his work had been nearly completed at the time of their published report, in December. The writer has attempted to make clear points not hitherto understood, and, long before the reports above referred to, had arrived at conclusions essentially the same, on many points at wide variance with pre-existing knowledge on the subject. Had he known that others were also reaching conclusions which he had reached, and invariably arrived at the same result,—viz., that the bacillus was not an obligate anærobe,—many repeated experiments could have been avoided and further research added.

* My thanks are due to Dr. Coplin for the directions given me in this research.

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Tetanus is by no means a new disease; it is described by Hippocrates and Galen. In 1859, Betoli related the case of a bull that died of tetanus after castration. Several slaves ate of the flesh of the dead animal, and of these, three were affected with tetanus, two of whom died. In 1870, Anger reported a case of spontaneous tetanus in a horse, after which three puppies, in the same stable, were also affected. Kelly, in 1873, had three cases in the same week, all arising in a civil hospital, and a few days later there was a fourth case in a neighboring hospital. Larger, in 1853, reports a case in which the patient received a slight injury while working in a barn yard, and in four weeks developed tetanus; on investigation, it was found that a horse affected with the disease had been in the stable opening into the yard in which the accident occurred. The same writer reports five cases in one village in eighteen months and under different climatic conditions.

Senn, who refers to Bonomi's observations, states that out of seventy persons injured by the falling of a church tower during an earthquake, seven were attacked by tetanus. Gower reports two cases following alcoholic intoxication; at least, there was no other assignable cause. As to puerperal tetanus, which occurs chiefly in tropical climates, it is supposed to be due, in at least a majority of cases, to retained placenta. The same writer reports that in Bombay, in three years, two hundred and thirty-two women died of the disease.

As to the time of incubation, it may last for varying periods after the infliction of a wound. The case reported by Dr. Robinson, where the patient cut or rather scratched his finger with a broken piece of porcelain, died of tetanus in fifteen minutes; although this occurred in a hot climate, and is reported as a case of tetanus, the diagnosis is to be questioned. Larrey, who had great experience with the disease during Napoleon's campaigns in Egypt, found that it occurred from the fifth to the fifteenth day. The reports of surgeons during the Peninsula war showed that the disease manifested itself after the twenty-second day; it may occur as late as one month, as in the case reported by Sir G. B. Lane. The wound may have undergone complete cicatrization before any symptoms appear.

Even racial peculiarity seems to effect the disease, as the dark-skinned are more likely to take it than the white, even when exposed to the same climatic influences. In traumatic tetanus the proportion between the sexes is six male to one female. The order of frequency with which the several parts have been the seat of the wound that caused tetanus is (1) hand; (2) leg; (3) foot; (4) head and neck; (5) arm; (6) trunk (Gowers). The disease is most common in Northern Italy, its maximum being in Lombardy. Hospital reports show a mortality of fifty per cent.; in private practice it is somewhat higher.

Stewart, of England, reports a case of tetanus in an infant fourteen days old. The cord was ligated in the usual way. On the fifth day the cord dropped off, and nine days after tetanus developed, and in five days more the child died. When tetanus developed the cord was perfectly healed (*British Medical Journal*, February 21, 1891, p. 405).

Cold climate and altitude is detrimental to the development of the disease, while a tropical climate tends to enhance its development. During the campaign of Caucasus, the weather being persistently cold, Pirogoff saw hardly any cases among the Russian wounded; while after battles during the warmer weather the mortality from tetanus had been great.

Of three hundred and sixty-three cases reported during the late civil war, three hundred and thirty-six died.

The disease sometimes seems to occur in epidemics; thus, in 1782, one out of every six infants born in the Rotunda at Dublin died within the fortnight after birth from the disease.

In St. Mark's Hospital, 1858, there were five cases of tetanus following operations for hemorrhoids.

Prior to 1884 various hypotheses were set forth as to the cause of tetanus. It was said to be a disease consisting essentially in an excited state of the spinal cord and of the medulla oblongata, in fact, of the whole spinal system, giving rise to painful and continued spasms of the voluntary muscles and the diaphragm, following a peripheral nerve irritation, causing an ascending neuritis (Erichsen). It was claimed by the same writer to be due to the irritation of the nervous system, from the presence of worms in the intestinal canal, and also by uterine irritation; it seems sometimes attributable to exposure or cold, and in this apparent causation it is called by some writers *tetanus a frigore*. It has been conjectured that the disease is sometimes a manifestation of rheumatism. Billroth states that "all symptoms indicate an ir-

ritation of the spinal cord," or of the portio-minor of the fifth pair.

In 1875, Professor Wm. S. Forbes, in a paper read before the College of Physicians of Philadelphia, in which he reported a case of traumatic tetanus, in speaking of the cause, stated it to be his belief "that it is a self-generated agent, akin to rabies and strychnine, exciting the nerve peripheries, which, by reflex action cause the augmented disintegration of muscular tissue, the product of disintegration further exciting the nerve peripheries until there is established the condition known as tetanus.

Rokitansky claimed to have seen the development of young connective tissue in the spinal medulla, which would make it appear that there was an inflammatory affection of this nerve centre. Goll, of Zurich, and Meynert, of Vienna, confirm this, but as to its cause there was a difference of opinion. Some writers do not believe that the nervous system is primarily affected, but think that the blood first becomes diseased and acts secondarily on the nervous system.

The morbid anatomy of the disease revealed nothing but what has been found in other diseases. Rose claimed that tetanus and hydrophobia were both primary blood-diseases, and it is a well-known fact that the two diseases are very much alike. It has been stated by some experimenters that by inoculating animals with the blood or secretions from a case of tetanus, hydrophobia was induced. Leyden produced tetanus in a dog by passing a strong current of electricity through the whole spinal medulla; the symptoms were accompanied by marked elevation of temperature. Frick claimed that a surplus of heat was formed in the muscles and thence distributed to the blood. Some writers (Erichsen and others) believed that depressing emotion predisposes to the disease; this form might be properly called psychical tetanus.

Theorizing as to how particular varieties of injuries to nerves produce tetanus is useless. It is rare that a simple division of the nerve produces the disease, but crushing and partial division have been attributed as frequent causes. The disease has followed simple wounds of the skin, and arisen from granulating surfaces, even after cicatrization; a blister, or the sting of an insect may produce it. All kinds of wounds cause it; such as incised, punctured, contused, lacerated, and surgical-operation wounds, as well as burns. In rare instances it has followed injuries which involved no breach of surface, as flogging or a fall on the back and spine. It has long been known that troops are peculiarly susceptible to it; also persons injured by fire-arms and toy pistols; persons engaged in taking care of horses are frequently affected, hence the "equine origin;" horse-dung seems especially open to suspicion, and it is found that ordinary dust, garden-earth, and surface-soil play an important part in the causation of tetanus. That tetanus is especially apt to occur in the feeble and debilitated has also been noted; hence any condition that lowers the tone of the nervous system is likely to cause the disease.

It is most likely to follow injuries of the extremities; in the present light of investigation this is to be explained on the ground that these injuries are more likely to be infective. A tropical climate seems to favor the disease, and altitude seems to lessen the liability to its development. It may occur at any age; the young, the middle-aged, and the old alike suffer, yet all cases follow traumatism, even the "tetanus neonatorum," which may follow the ligation of the umbilical cord. Although the disease was known to be infectious, it was only in 1884 that the microbian cause was discovered, almost simultaneously by Nicolaiev and Rosenbach. Nicolaiev showed the exogenous origin of the disease by finding the bacillus of tetanus in earth. Rosenbach found a similar bacillus in the pus from a case of traumatic tetanus. The identity of the bacillus of tetanus with Nicolaiev's bacillus of earth tetanus was demonstrated in Koch's laboratory, April 10, 1887. The discovery made by Nicolaiev and Rosenbach has been confirmed by many noted bacteriologists, such as Koch, Carle, Ratione, Beumer, Giordano, Ferrari, Hacksinger, Shakespeare, Bonomi, Brigger, Kitasato, Park, Abbott, Welch, and many others.

The ptomaïnes of tetanus have been isolated, but the writer was unable to make any investigation on this subject. The four ptomaïnes isolated are (1) tetanine; (2) tetanotoxine; (3) not named; (4) spasmotoxine. It is generally conceded that the cause of death in the disease is due not to the bacillus, but its products,—the ptomaïnes.

The history of the case which I studied, which extends over a period of thirty-five days, is as follows:

M. J. McL., male, aged 20, residing in Philadelphia, is by occupation a stone-cutter. On August 5, while at work, he stepped on

a board containing three sharp-pointed scaffolding nails, the nails being driven through the board so that they pointed together; the sole of his shoe being thin, the nails penetrated into the foot, inflicting a punctured wound three quarters of an inch in depth, extending obliquely inward at a point one inch behind the last metatarso-phalangeal articulation; the injury caused him so much pain that he was obliged to quit work immediately. He applied at a drug-store for something with which to relieve his pain, and was given a bottle containing equal parts of *tinctura opii* and *liquor plumbi subacetatis dilutus*. The wound was not opened, and nothing was done to cleanse it or in any way to render it antiseptic. The solution was applied to the injured part by means of cotton and lint.

At 8 P.M. the wound was very painful, slightly swollen, with great discoloration of surrounding parts. A poultice of bread and milk was applied, being placed over the lint and cotton; this was left on until 8 A.M., when the poultice and lint were removed, and a few drops of bloody serum and pus showed on the cotton which was next to the wound. The patient had passed a quiet night. The wound was then washed in water in which wood ashes had been soaked for three hours; this was on the morning of August 6; after washing the wound in this solution a large piece of fat bacon was applied. This treatment was continued until August 9, the patient suffering very little pain. The wound closed on the third day; no discharge on the dressings, except the first two, and then only a few drops of pus and blood. The foot was slightly swollen, but at no time very painful. On Saturday, August 9, the fat pork was followed by flaxseed poultices, and this treatment continued until August 16, when all treatment was stopped. The wound was never washed out, and remained closed after the third day. On the 13th the swelling entirely left the foot, but on the next day, when dressing it, the patient noticed some discoloration on top of the foot, extending out to the toes; this had all disappeared by the 16th.

On Friday, August 15, he felt a stinging sensation, seeming to originate in the temporo-maxillary articulation. On moving the jaw slight rigidity was found to exist; also slight rigidity of the muscles of the neck. These symptoms continued until Monday, the patient saying nothing as to his condition at the time.

On Monday, August 18, the patient resumed work, but on account of increased rigidity of muscles and general indisposition he was unable to work longer than 12 M., when, on attempting to eat his dinner, his jaws were more rigid, deglutition difficult; he suffered from pain in his back, occipital headache, weakness in the lower extremities, and slight muscular inco-ordination.

During the afternoon he called at Dr. Smith's office; this was the first medical advice sought. After examining the patient Dr. Smith pronounced it a case of tetanus, and gave him a plaster for his back and prescribed for him; what was prescribed the writer was unable to learn. Two doses of the medicine were administered, and that evening, August 18, the patient sought medical advice at Dr. J. W. Hearn's office. Dr. Hearn being out of the city, he was examined by Dr. Coplin.

On examination the condition of the patient was found as follows:

Temperature 99° F., pulse 90, muscles of the jaw rigid, the patient not being able to open them more than one-half inch; there was inability to protrude the tongue, rigidity of the muscles of the neck, flushed face, and quick, jerky articulation; on tapping the muscles of the face great pain was produced; he also complained that the jostling and jolting of the car increased his pain; the expression of his face showed mental anxiety; his bowels were constipated. The patient could not take solid pabulum, but could imbibe fluids, showing marked difficulty of deglutition. He complained of temporo-frontal headache. From the symptoms given and history, the case was diagnosticated one of traumatic tetanus; he was ordered a saline purgative and a mixture containing bromide of sodium, 1 drachm to each dose, to be given every two hours, and the importance of feeding the patient at intervals of every two hours was urged upon the parents, the diet to consist of liquids, especially milk, to be administered frequently, so that not less than thirty-two ounces of milk be given in twenty-four hours; also broths and beef-tea to the same amount. He was ordered to bed in a dark room, and to be kept absolutely quiet.

On August 19, at 2 P.M., Dr. Coplin paid the first visit to the house. The patient had then taken one ounce of the bromide of sodium; the trismus was still marked; the rigidity of the muscles of the neck was increased, with marked arching forward of the lumbar region (opisthotonos). He complained

of twitching and jerking of the muscles in the injured limb, affecting more particularly the calf muscles and gluteal muscles. The opisthotonos was more marked during the pains, the facial expression distorted (risus sardonicus), lips cyanotic, finger-nails blue, respiratory movements quickened, and short clonic and tonic spasms were induced by any movements which involved the muscles of the neck, back, or inferior extremities; also by attempts at laughter,—less marked by talking; mental condition showed no change, except he was lapsing into a condition of indifference as to the termination of his case. The foot was carefully inspected, and no evidence of inflammatory process, either upon dorsum or plantar surface, could be observed; except at the point where the nail had entered, it would have been impossible to have told which foot was the seat of the disease; cicatrization was complete. At the point of the wound there was a small indurated area, about one-half inch long and one-quarter of an inch wide, somewhat tender, which produced convulsive movements of the limb and increased the opisthotonos when pressed upon. It was not surrounded by an area of redness, and showed no evidence of an inflammatory process other than that offered by the tenderness.

The advisability of opening the wound was discussed at the time, but the full consent of the patient and family could not be obtained. Treatment was ordered continued, and on account of the large number of friends who had visited the patient, the family were again made fully aware of the necessity of absolute quiet; the patient was ordered to a larger room, put in a large, roomy bed, and the feather-bed was removed.

On the 20th the trismus was marked, and general tetanic condition was certainly unimproved, if not more marked. The necessity for opening the wound was urged upon the family, and conditional consent was obtained, providing he was no better on the following day. The patient's sleep had been interrupted, restless, irregular, rather a condition of somnolence than sleep, from which he was aroused by the slightest noise; even the striking of a parlor match in the room annoyed him; symptoms of mental aberration began to evince themselves; while apparently perfectly conscious he made remarks which had no connection with his surroundings; he was laboring under the impression that he was not at home, and expressed a desire continually to be taken home.

On the 20th the patient had a slight nasal hemorrhage, the blood being collected on a linen handkerchief, and kept for inspection. (See laboratory notes.) The amount of urine passed was about forty ounces per day, and it was dark colored. (For report see laboratory notes.) He recognized all his friends and acquaintances who were permitted to see him, but inquired for no one.

On the evening of the 20th, Dr. Coplin called on Professor Bartholow, and gave him a brief outline of the case and details of treatment, which met with his full approbation, except that he urged the necessity for opening the wound.

On the 21st the trismus was improved; the tongue could be slightly projected; it was coated with a brownish, furry coat; the surface was fissured longitudinally, and slightly swollen; the secretion of saliva was apparently diminished, although respiration was carried on through the nostrils; the lips and whole mucous surface of the mouth were dry and parched; the lips were slightly blue; the patient was indifferent as to his condition, and seemed to have lost all interest in the ultimate result of his case; he had hallucinations, imagining work was going on in his room,—working at his occupation; although he recognized all his friends and answered all questions rationally, the general tetanic condition was worse and tonic contraction of the muscles was most marked; when the nurse laid one of the patient's feet across the other he could not move it on account of extreme rigidity of the muscles.

The consent of the family having been obtained, it was decided to open the wound. The foot was thoroughly antisepticized, first scrubbed with soap and water, and then with a solution, as follows:

℞ Hydrarg. chlor. corros., ʒi;
Ammonii chloridi, ʒi;
Alcohol, q.s. ad f℥i.
Sig.—One drachm of this solution to one pint of water.

The instruments were rendered thoroughly aseptic by means of heat and carbolic solution. An incision one inch in length was made through the seat of induration. From the wound blood was drawn by means of vacuum-tubes, assisted by a fillet around the limb to prevent the venous return; about two ounces of blood were withdrawn from the wound. In the bottom of the wound was a sinus, which contained sero-sanguineous fluid, but no pus; in the blood that escaped, minute particles of rust and other foreign sub-

stances were found, both macroscopically and microscopically. The blood was all collected in tubes for examination. (See laboratory notes.) The wound was then washed out with an aseptic solution, as first used; after thoroughly washing and drying the wound, it was mopped out with pure bromine and packed with iodoform gauze; a dressing of bichloride gauze was applied with a turn of the roller. The bromides were increased to 45 grains of the sodium salt and 15 grains of the ammonium salt every two hours. At 9 P.M. the patient was resting easier, was evidently affected by the bromides, and upon rousing him to take his medicine would immediately be attacked with paroxysms of pain, the muscles become rigid, and he would assume the position of opisthotonos; at times he would lapse into a restless sleep, or rather somnolence, from which he would be disturbed by pain, the body assuming the characteristic position and the face being distorted. He was aroused every two hours, and the medicine given regularly.

Friday, August 22, at 9 A.M., on rousing the patient, exacerbations of spasms took place, during which the muscles became very hard; these paroxysms lasted from one-quarter to one-half minute, and were accompanied by excruciating pain in the suboccipital and lumbar region; the tetanic symptoms were more marked than on the previous day; the trismus remained the same, the jaws being in a semiclosed condition, which condition they had been in from the beginning of the disease, as the patient, finding his jaws gradually becoming set, pushed between them some of the bedclothes, thus preventing their entire closure; the angles of the mouth were slightly drawn upward and backward, giving him the peculiar expression called *risus sardonicus*.

At nine in the evening, the thermometer marked an increase of two degrees, the other symptoms continuing about the same, except the tetanic wave, which was increased; each paroxysm showed increasing intensity, the patient assuming the positions of opisthotonos, emprosthotonos, and pleurothotonos, alternating from one to the other during the spasm. The patient, since the morning of the 19th, had taken one drachm of bromides every two hours, making one and one-half ounces in the twenty-four hours, and in all, up to the morning of the 22d, four and one-half ounces. The symptoms were increased in intensity from six o'clock until eleven in the evening; the paroxysms could be excited by mental emotion and by peripheral impressions. During the paroxysm the tetanic fixation of the respiratory muscles threatened a fatal termination by asphyxia; this condition led to the most marked irregularity of the cardiac movements, both in number and in rhythm; attempt was made to use the sphygmograph and cardiograph, but the jerking tendons, and rapid alternation between posterior and lateral arching of the trunk, precluded their use either at the wrist in the one case, or at the apex in the other. The bowels being constipated, an enema of hot water was ordered; this failing, it was repeated in the morning; the stool consisted of hard masses of fæcal matter. The patient was ordered, in connection with the bromides, 15 grains of chloral, to be taken every two hours, making in all three drachms of chloral and twelve drachms of bromides in twenty-four hours. The patient's intellect was unaffected.

August 23.—Same treatment continued; the trismus was still well marked; the other symptoms were increased; the spasm often commenced in the injured limb. This fact is of much interest, as many writers, of which Gower is the most prominent, assert that the spasm rarely, if ever, begins in the injured limb. It is also stated by some writers (Flint and others) that the paroxysms occur more during the day; if there was any difference in this case, they were more frequent at night. During the intervals between paroxysms the patient assumed the characteristic position of the disease; his condition was that of stupor or somnolence rather than natural sleep; occasionally he would lapse into a sleep from which he would be aroused by paroxysms of pain.

The nourishment taken by the patient consisted of thirty-two ounces of milk and twenty-four ounces of the beef-tea in twenty-four hours. The temperature showed the usual morning remission and evening exacerbation. The paroxysms, although brief, were repeated frequently,—every ten to twenty minutes, lasting from a few seconds (five) to one-quarter of a minute; the clonic paroxysm was accompanied by tonic spasm, affecting different groups of muscles; the patella tendon reflexes were exaggerated; the ankle clonus could not be tested satisfactorily, but we failed to elicit it at any time.

August 24.—The patient showed no change in symptoms from the previous day, but the effects of the combined use of the bromides and chloral were manifesting themselves; the

medicine seemed to hold the spasm in abeyance for a time after administering, but as the effects of the medicine gradually passed off, the spasms recurred, seemingly in increased proportion to the length of the time they had been held in abeyance, the longer the period of rest the more intense the succeeding tetanic paroxysm. The wound was dressed with antiseptic gauze and the nurse ordered to keep the dressings damp with a bichloride solution (strength 1 to 1000). The amount of nourishment was increased to six ounces of liquid diet every two hours, and the necessity of nourishing the patient was urged. The nurse was also directed to administer the medicine and aliment regularly,—every two hours,—unless the patient was asleep, in which case the interval was not to exceed four hours. Treatment was continued as before ; the patient's bowels still being constipated, he was ordered one ounce of the *liquor magnesii citratis* of the shops, to be repeated every two hours; this was also supplemented by a soapsuds enema night and morning ; the constipation was obstinate, but was overcome on the following morning.

The tonic rigidity of the abdominal muscles was most marked ; by palpation the feeling was that of passing the hand over marble. During the paroxysms of pain, the muscles of respiration being interfered with, the respiratory movements were limited in depth and increased in number ; the respirations increasing to as high as thirty-two per minute, their character jerky, irregular, and shallow ; during the paroxysms of pain the body was bathed in perspiration. It is a matter of interest to note at this point the remarkable connection between the spastic conditions and increased sudorific activity. Post-mortem sweating has been noted in cases of well-marked and rapidly-developed rigor mortis, and explained on the hypothesis that the contraction has squeezed out the already secreted fluid in the gland. This same hypothesis is here applicable and well taken, as it seems hardly possible that in fifteen to thirty seconds the large drops of perspiration could have been secreted. The urine was scanty and highly colored, with specific gravity 1024, due to the exaggerated cutaneous activity.

August 25.—No change in the symptoms from the day previous, except a decline in temperature of one degree ; the patient manifested no concern as to his condition and took no interest in his surroundings, but on being aroused, answered all questions intelligently. During the tetanic spasm the pupils always showed pin-point contraction, resuming the normal condition during the intermission. On the evening of the 25th slight symptoms of bromism were manifested ; the patient's sensation was slightly impaired, and there was fetid, bromine breath, with cold extremities. The food consisted of thirty-two ounces of milk, animal broths thirty-two ounces, and two soft boiled eggs during twenty-four hours.

August 26.—The symptoms of bromism were more marked ; the trismus was much diminished, while the tetanic symptoms showed no diminution, except, while held in abeyance by the combined action of the bromides and chloral. On examining the patient the peculiar acne of bromism showed plainly on his face, shoulders, and upper extremities. There was marked pallor, and the heart was quick but strong, and there was a general subjective sense of coldness, the muscular movements being tremulous and uncertain. The patient was unable to put his hand to his mouth or to cross his leg ; there was, in fact, well-marked muscular inco-ordination.

The altered character of the voluntary muscular movements presented so many points of interest as to merit the closest study. The modified motor and sensory conditions were due, of course, to the presence of the two conflicting elements,—viz., the tetanus and bromism; these producing subjective and objective phenomena complex and not constant in any two consecutive observations. This may be illustrated by the fact that the patient could not put his hand twice in the same place ; if a hand was held out to him for hand-shaking, he would see it, recognize what the object was, and make futile attempts to grasp it, rarely succeeding ; his grasp when obtained was firm, even exaggerated, and he was little conscious of the force which he exerted, many times causing pain in the hand grasped, so firm was his grip. There was no loss of muscular power. Lying in his bed he could not cross his legs, although he was able to move them, even when attempts to restrain such movements were made. There was marked perversion of the so-called muscular sense. As already noted above, he was little cognizant of the force used in hand shaking ; in conveying a glass to his mouth, he was likely to bring it abruptly against his face at almost any point ; his feet would press firmly against anything without his being conscious of the resistance. With

this condition there was perversion of cutaneous sensibility; heat and cold could be differentiated unless intense,—*e.g.*, ice could be told from water at 130° F., but between 45° F. and 110° F. he could recognize no difference upon prolonged contact. The æsthesiometer elicited some very interesting facts; one point could be recognized, but he could neither tell where he was being touched nor could he put his hand on the painful point; he could only recognize two points when they were forcibly applied and under the most favorable conditions, at least four inches apart, if on the lower extremities, and but slightly, if any better, upon the upper; the anæsthesia was well marked over the abdomen and the muscles of mastication; two points could not be detected if applied to one finger, but if applied to two fingers, he could not tell which finger. After a few experiments the sensation became so perverted that he would declare you were touching him when no one was near him; this could only be disproved by his seeing. The sensation conveyed to the sensorium through the sense of sight and hearing were never perverted, and only at brief intervals did he show the least tendency to temporary mental aberration, and this only when in the broken, restless, soporific condition, which we might term sleep. His mental condition was one of hallucinations and delusions, he imagining work was being carried on in his room; sometimes his ideas were based on false objects, and then again based on a true object with a false idea, but at all times could he be reasoned out of his belief, and never was his condition one of insane hallucination or insane delusion. He would often talk in a rambling manner and often indulged in meaningless and uncontrollable laughter. The mucous membrane of the mouth showed the same perversion of sensibility as already noted of the skin; taste was perverted; everything tasted sour; coffee could not be sufficiently sweetened, and even the bromide mixture, made with syrup, had a taste of acidity. The patient's temperature had now declined to normal, 98.6° F. The nourishment taken was diminished from the day previous, consisting wholly of liquids, to the amount of twenty-four ounces in twenty-four hours, being allowed all the water he wanted to drink.

August 27.—The symptoms of bromism more marked; the temperature declined to subnormal,—98.5° F.; the trismus much diminished, the tetanic spasms occurring at greater intervals and with less severity. In the evening the bromides were stopped; the patient up to this time having taken thirteen and one-half ounces of the bromide and one ounce and seven drachms of chloral in eight days; the patient was ordered to continue the chloral in 15-grain doses every two hours for three doses, beginning at 9 A.M.; no more to be taken unless symptoms demanded.

August 28.—Patient rested well during the night, the paroxysms of spasms being less frequent and lighter. The tonic rigidity of the muscles of the neck and jaw showed lessening in degree, while the abdominal muscles were in a state of marked tonic rigidity; the patient's bowels were kept open by means of enemata and magnesium sulphate in drachm doses; nourishment consisted of forty ounces of milk and sixteen ounces of chicken-broth; chloral administered at 1, 3, 5, and 7 P.M.

August 29.—Temperature had risen to one-half a degree above normal; slight diminution in all the tetanic symptoms, except marked rigidity of abdominal muscles; chloral administered at 8.30 and 10.30 P.M.; the nourishment same as the day previous.

August 30.—Chloral at 1, 3, 8, and 10 A.M.; trismus less marked, patient being able to open his mouth and partly protrude the tongue, but the muscles of the jaw were still stiff, as well as the muscles of the neck.

August 31.—The symptoms continued the same, the tetanic spasm being slightly more marked but at longer intervals. Chloral was given at 4, 6, and 8 A.M. and 7, 9, and 11 P.M.; the circulation showed no signs of weakening. The medicine was now changed, and he was ordered the following prescription:

℞ Chloralis,
Sodii bromidi, āā gr. xv;
Extract. hyoscyami,
Extract. cannabis indicæ, āā gr. ½.
Sig.—To be taken every two hours as indicated.

The amount of chloral taken up to this time was two ounces, three drachms, and forty-five grains.

September 1.—The tonic rigidity of the abdominal muscles was still marked, the patient resting well during the night, with occasional paroxysms of spasm; these paroxysms never occurred during sleep. Pulse was regular, although always increased in frequency during the spasm, which was probably due to a general vaso-motor spasm, due to excessive muscular contraction. The temperature in the morning was normal, with an evening rise of one degree. Patient's nourishment for the day consisted of thirty ounces

of milk and eighteen ounces of broth. The medicine was given at 8 and 10 A.M. and 4.30, 8.30, and 10.30 P.M., and the patient was also ordered one-half ounce of beef peptonoids, to be given four times a day regularly.

September 2 to 8.—Symptoms continued about the same, the tetanic symptoms gradually becoming lighter and less frequent; the incision at point of wound had entirely healed. Some stiffness of the muscles of the jaw and extremities was noticed, more especially the extensors. The patient had now fully recovered from the effects of the bromide. The medicine was administered on September 3 at 9 and 11 A.M. and 1 and 3 P.M.; on September 4, at 11 A.M. and 3, 5, 7, and 9 P.M.; on September 5, at 2, 5, and 8 P.M.; on September 6, at 11 A.M. and 6 and 9 P.M.; on September 7, at 10 A.M. and 4 and 9 P.M. The bowels during this time were constantly constipated unless relieved by purgatives or enemata.

September 8.—The patient was able to take solid food for the first time, the muscles of his jaw being considerably relaxed; he was able to use the muscles of mastication, although they were somewhat limited in their action, and he still complained of dull aching pains in his extremities, especially in the injured limb. The medicine was used at 4, 8, and 11 P.M.

September 9, 10, 11, and 12.—Symptoms continued the same, the tonic rigidity of the muscles gradually lessening in inverse order from their appearance, disappearing first in the parts affected last.

On the evening of the 12th the patient complained of severe pains shooting all through his body; the abdominal muscles were still very rigid, and temperature slightly elevated (100° F.). There was slight increase in the tetanic symptoms. The medicine was administered September 9 at 4 and 6 P.M.; September 10, at 5, 8, and 11 P.M.; September 11, at 9 A.M., 1 and 5 P.M.; September 12, at 10 A.M., and 2, 4, 6, 8, and 10 P.M. Food, consisting of milk, toast, soft-boiled eggs, and coffee, in fact, any easily-digested food, was given. The patient complained of great pain on moving.

On morning of September 13 the patient complained of pain on top (dorsum) of foot, at a point opposite the original wound. Upon examination, all the local signs of an abscess were present,—pain, swelling, heat, discoloration. The medicine was administered on 13th at 5 and 7 A.M. and 9 and 11 P.M. The foot was dressed antiseptically, and on the following day, the 14th of September, upon examination by Dr. Coplin, it was decided to open the abscess, which was done immediately, under the strictest aseptic and antiseptic precautions. When opened, it discharged two drachms of blood and pus; the wound was thoroughly irrigated with a 1 to 1000 solution of corrosive sublimate; a free incision was made, and drained by means of rubber tube and ligatures; then dressed with antiseptic gauze held in position by turns of a roller. During the operation the patient showed no signs of tetanic spasm, only of pain such as would usually attend the opening of an abscess; no anæsthetic was given; medicine was administered at 7, 9, and 11 A.M. and 3, 5, and 7 P.M.; on the night of the 14th the patient rested well, being disturbed by occasional paroxysms of pain.

September 15.—On redressing the foot and removing the tube, very little discharge on the dressings was found. Patient complained of dull, grinding pain in his body, extending down his left leg; the wound showed very little signs of inflammation; it was dressed antiseptically, and the nurse ordered to keep the dressings damp with the antiseptic solution. Abdominal muscles still rigid; no trismus; the patient was still unable to protrude the tongue normally; was cheerful and talked rationally. The medicine was administered at 9 and 11 A.M. and 1, 3, and 5 P.M. The nourishment consisted of soup, rice-pudding, and some solid food.

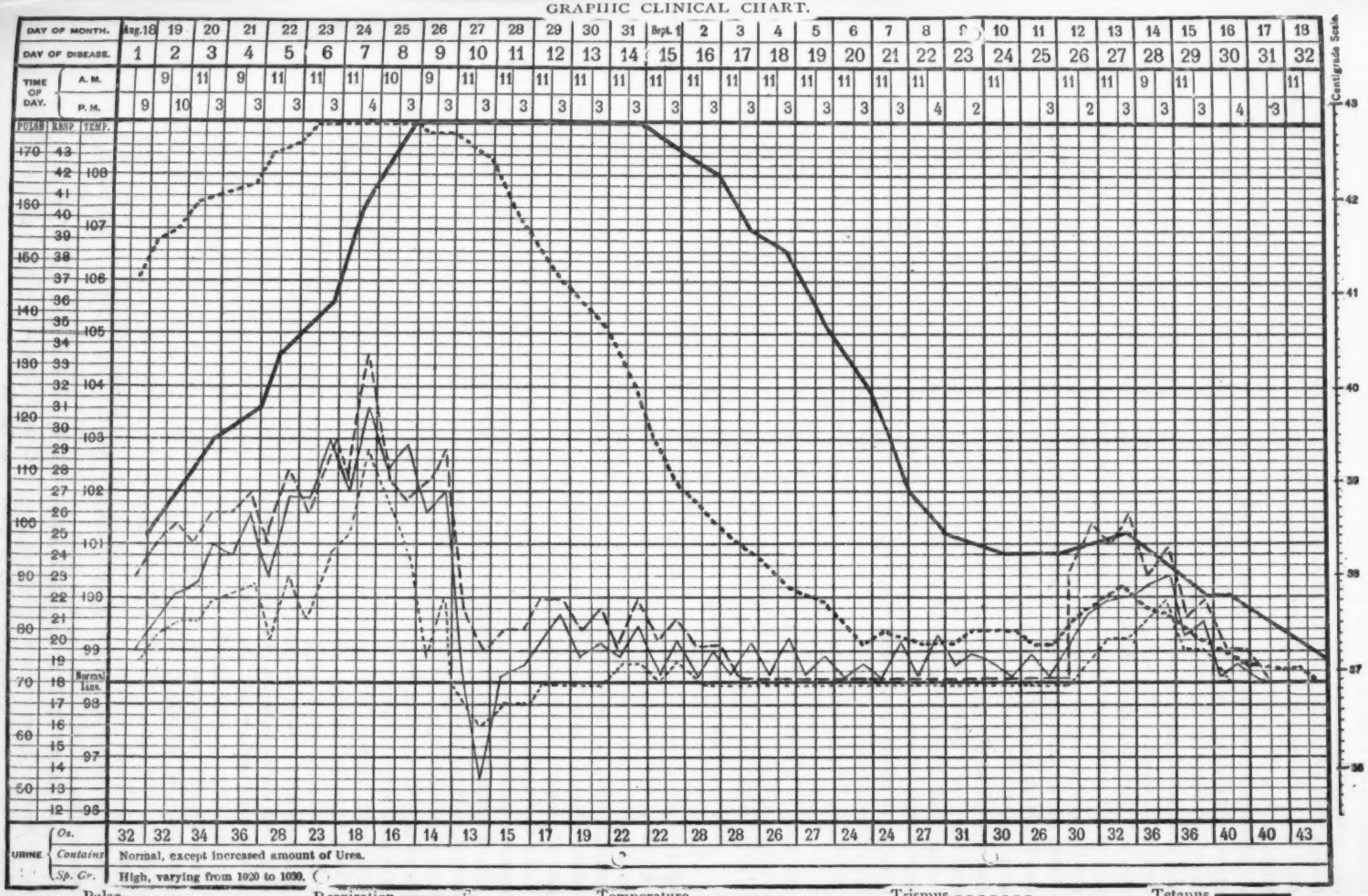
September 16.—Patient was resting comfortably, having slept six hours during the preceding night; the tetanic symptoms lessened, with long interval between spasms, but still complained of the dull pains extending all over his body; temperature normal; respiration 18; pulse 74; on dressing the foot, dressing showed no discharge except a little bloody serum; the wound was thoroughly washed out and redressed as before; medicine administered at 9 and 11 A.M. and 2 and 6 P.M.

September 17.—The patient was able to sit propped up in bed; no paroxysms or spasm; lessened rigidity of abdominal muscles, but still complaining of the pains, especially in the limbs. Temperature, pulse, and respiration normal; medicine administered 9 and 11 A.M. and 5 and 7 P.M.

Saw the patient again on the 19th of September, and found his condition much improved; pains diminished and wound almost entirely healed; the patient, on attempting muscular movements, showed great muscular

GRAPHIC CLINICAL CHART.
DAY OF MONTH. Aug. 18 19 20 21 22 23 24 25 26 27 28 29 30 31 Sept. 1 2 3 4 5 6 7 8 9 10

GRAPHIC CLINICAL CHART.


DAY OF MONTH. Aug. 18 19 20 21 22 23 24 25 26 27 28 29 30 31 Sept. 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18
DAY OF DISEASE. 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32
TIME OF DAY. A. M. P. M.
PULSE RESP. TEMP.
Centigrade Scale
Normal lines.
URINE. Os. Contains Sp. Gr.
32 32 34 36 28 23 18 16 14 13 15 17 19 22 22 28 28 26 27 24 24 27 31 30 26 30 32 36 36 40 40 43
Normal, except increased amount of Urea.
High, varying from 1020 to 1030.
Pulse
Respiration
Temperature
Trismus
Tetanus

NOTE.—There cannot be, of course, any true method of measuring degree or intensity of trismus or tetanus, and the graphic presentation is traced upon the chart merely with the idea of conveying to the eye the relation between the true graphic record of pulse, temperature, and respiration, and the general symptoms of the disease; also to emphasize the

inco-ordination; all medicine was ordered discontinued; and the patient's bowels being constipated, he was ordered a saline purgative, and relieved on the following day by rectal enema.

Patient was seen again on the 22d; he was able to walk about the room by the aid of a cane, still complaining of pains in his limbs and soreness of muscles, and also of a condition of malaise. He was ordered easily-digested food, moderate amount of exercise, and, as no further attention was necessary, the visits were discontinued.

One remarkable fact in the patient's favor was the large amount of nourishment taken, also that the bowels were kept constantly open, never, under any circumstances, being over forty eight hours without being moved.

The total amount of the bromides administered was fourteen and one-half ounces; chloral, three ounces, three drachms, and forty-five grains.

(To be concluded.)

ARISTOL IN INTERSTITIAL KERATITIS.

By James Wallace, M.D.*

THE practitioner who has to treat this intractable affection, and, perhaps, has been mortified by failure to realize his predictions, will hail with pleasure the suggestion of any plan of treatment which will stand the test of producing permanent improvement in half a dozen cases, witnessed by two or more competent observers.

It is not with a view of urging aristol in all stages of the disease that the present paper has been written, but to direct attention to its efficacy in clearing up the *débris* of the inflammation and removing the irritation and congestion of the conjunctiva and cornea. The general principles of treatment must remain unaltered, as the disease is a local inflammation due to a cachexia, usually syphilitic, more rarely malarial. The local remedies in the early stages are the same as ever, atropine, cocaine, leeching, etc., while the constitutional measures consist of mercury in some form, or, in appropriate cases, of anti-malarial treatment,—quinine, arsenic, eucalyptus, etc.

After the acute symptoms of the disease have somewhat subsided, and the dense corneal opacities veil the interior of the eye from ophthalmoscopic examination and admit only a diffused light to the retina, the task before the surgeon is to remove this impediment to vision. The usual methods are insufflations of calomel, iodoform, etc.; the rubbing of the cornea through the lids, sometimes with the addition of the ointment of the yellow oxide of mercury; and even electricity.

It must always be a question of serious consideration whether the remedy employed, while promoting the desired effect in the more chronic portions of the affected tissue, does not also by irritation extend the morbid process to areas previously unaffected, and thereby produce a total opacity instead of a partial one. The judgment of the operator in selecting the proper time at which to employ the stimulant applications, usually prevents such untoward results. In order to avert these it may be necessary for him to defer the means of clearing the corneal opacities to such a lengthened period that the patience and confidence of the affected individual become exhausted.

The continuous use of atropine and cocaine often produces in the conjunctiva an enlargement of the follicles associated with hyperæmia and sometimes with increased secretion. This led me to introduce some aristol into the cul-de-sac for the purpose of allaying the conjunctival trouble. I rather expected an increase in the pericorneal injection and photophobia, but was agreeably disappointed in finding that both were somewhat lessened immediately, and, after a few applications, almost entirely disappeared. After convincing myself that the effect upon the corneal opacity was real, I sent the patient to Dr. G. E. de Schweinitz, as she had been under his treatment years before, for his inspection; the improvement led him to try the remedy in the wards of the Philadelphia Hospital, where he has rich clinical material in ophthalmic diseases. The first case in which I used aristol was the following:

Case I.—Jennie P., aged 18. Eyes first affected seven years before. The first attack lasted two years, after which an immunity from the disease for two years followed. The second attack commenced three years ago, principally in the left eye. The ravages of the disease were so extensive that at one time the eyeball seemed to be in a state of general suppuration; nevertheless, improvement of the eye took place under the use of atropine and eserine. The cornea slowly cleared and a vision of $\frac{6}{30}$ was ultimately attained.

* Chief of the Eye Dispensary, University Hospital.

The young lady accepted a position as bookkeeper in spite of emphatic warning about the consequences. The right eye at this time had a vision of $\frac{6}{30}$ with the correcting glass. Symptoms of discomfort set in almost from the beginning of her duties; congestion of the cornea, and finally intense inflammatory changes followed, confined entirely to the right eye. Though repeatedly urged she would not give up her position until these lesions reached such a degree as to terrify her.

The treatment employed was inunctions of mercury; atropine, cocaine, and eserine locally; and, on account of dyspepsia, pepsin and bismuth. The aristol was first applied about the third month of the disease, and produced almost immediate improvement in the cornea, It has been continued for nearly eight weeks, and the improvement has progressed steadily. Almost all congestion has disappeared, and the cornea has cleared, allowing a view of the iris. Vision has risen from $\frac{6}{180}$ to $\frac{6}{30}$. The most noticeable feature about its employment is the absence of any marked irritation.

CASE II.—Lilly H., aged 16. A case of second attack of the disease. The first attack occurred a year before. The present attack was accompanied by severe blepharo-spasm, which yielded in a few days to cocaine and energetic inunctions of mercury. After the acute symptoms had subsided, aristol was dusted in the cul-de-sac, and the condition of the cornea in each eye steadily improved.

CASE III.—Jennie S., aged 16. A case almost identical with the previous one. The treatment was similar in the early stages, and the dusting of aristol was instituted at the same time as in the former case. The effect was in all respects the same; no irritation followed its use, and the cornea steadily cleared. The congestion of the conjunctiva diminished markedly, and the eyes tolerated light to a much greater degree.

The following two cases have been studied and described by Dr. de Schweinitz, and are appended as an independent and impartial observation of the effect of this remedy in the disease under discussion.

CASE IV.—Joe Dawson, aged 27; very imperfect family history, but states that as a child was taken to an eye hospital in London, and told that he "inherited eye disease from his parents." From childhood his eyes have been very weak, and he now sees badly. Eight years ago an iridectomy was performed in the left eye for optical purposes, but apparently without much benefit. During the last three or four years his vision has declined, most markedly in the left eye. He was admitted to the wards of the Philadelphia Hospital on the 17th of November, and then presented a very diffuse interstitial haze throughout the right cornea, and a somewhat discolored iris as far as this could be seen. The deeper structures were invisible. In the left eye, in addition to the diffuse corneal haze, there was a thick central leucoma. Vision in each eye equalled counting fingers at six inches. The patient was put upon iron and bichloride of mercury, and aristol was dusted into his eyes daily. In just one month from date (December 18, 1891) the vision had improved to counting fingers at one and one-half feet. This improvement was solely due to the dissipation of corneal haze. It is now manifest that there are very extensive changes in the vitreous, and even if the corneal haze should entirely disappear there will be no marked improvement in vision.

CASE V.—Thomas Healy, aged 31; family history not entirely obtainable; no evidence of ocular complaints in the family; the patient suffered from right-sided hemiplegia in May, 1891, the attack coming on while he was driving. Immediately after his recovery of consciousness there was double vision for a short time, and soon after that a keratitis developed in the right eye, in all particulars resembling interstitial keratitis. This keratitis probably began in the latter part of September. The patient was admitted to the nervous wards of the Philadelphia Hospital October 12, 1891, and was transferred to the eye wards on account of the ocular conditions. He was ordered atropine and mercurial inunctions; the latter were afterwards replaced by iodide of potassium. On November 9 there was general interstitial haze throughout the cornea, hiding the entire iris, with the exception of a small rim in the periphery; occupying the upper one-third of the cornea there was a typical "salmon-patch of Hutchinson." Aristol was dusted into the eye daily. Vision at this time equalled fingers at one foot. Almost from the day of the use of this drug the cornea began to clear.

December 7 the cornea had cleared, especially below, and the optic disk was dimly seen. Vision equal to $\frac{6}{60}$.

December 18, cornea much clearer, a triangular patch of haze marking the position of the former vascular patch, with one or two smaller saturated spots alone remaining. Eye-ground quite clearly seen. Vision equals $\frac{6}{40}+$, without the aid of any glasses.

*TREATMENT OF INFLUENZA BY DRUGS.**

By H. A. Hare, M.D.†

THE disease known as influenza influences various individuals so differently and presents so many symptoms associated with functional disorder of various organs in the body that it is almost impossible in the brief time which has been allotted to my paper to do anything more than consider the remedies which are to be employed in the treatment of the more frequent or more immediate manifestations or complications. Greater in importance than the employment of drugs must be regarded continuous rest, and stimulants are in many cases absolutely essential.

In those cases in which the disease is ushered in by a severe chill, accompanied by violent pains in the back, if the patient is seen early enough, it may be necessary to employ remedies for the relief of the rigor, with the double purpose of improving the patient's general condition and preventing internal congestion of vital organs. In the majority of instances, however, the patient will not be seen during this period of the disease, but during the febrile stage, which succeeds that just mentioned. Under these circumstances I do not believe that it is well for the physician to resort to any of the remedies which have been so largely used during the last few years, and which are known as the "antipyretics," or the derivatives of coal tar. Although originally introduced for the purpose of reducing febrile temperatures, practical experience has taught us that their sphere of action is very limited under these circumstances, and, personally, I may say, I almost never give antipyrin, phenacetin, or acetanilide with the object of reducing fever. Although I do not believe that these remedies are to be used for the reduction of temperature, I have certainly seen very marked relief follow their employment, with the object of relieving the severe pain which occurs in the back, limbs, or head. Small doses are usually sufficient to at least reduce the suffering, if not to remove it entirely, but as cardiac complications are by no means unusual, large doses are contraindicated in most persons. I prefer to allow the patient to suffer from a moderate degree of pain than from the dangers incident to the administration of doses large enough to entirely relieve it, because in my experience these doses have to be very large if they are to be entirely competent as analgesics.

If any of the coal tar products are used either for the relief of fever or of pain, I think that phenacetin and antipyrin should be chosen. Experiments made in America and in Germany on animals have proved that phenacetin is far less toxic in its relations to the heart than is antipyrin or acetanilide, and while it has in a number of instances seemed more inclined to produce cyanosis in man than either of the other drugs, this cyanosis rarely, if ever, has been associated with any other dangerous symptoms. Indeed it is quite extraordinary the amount of cyanosis which phenacetin may produce without the respiration becoming greatly disordered, very much less cyanosis, when caused by acetanilide or antipyrin, being accompanied by much more alarming symptoms. A very favorite combination with practitioners who have had a large experience is one of salol and phenacetin. The action of the phenacetin in relieving the pain and in reducing the fever seems to point to it as a rational remedy, but the exact influence of salol under these circumstances is not so clear. Composed, as it is, of sixty per cent. of salicylic acid and forty per cent. of carbolic acid, it seems to possess a therapeutical power different from that possessed by either of these two constituents alone, for neither carbolic acid or salicylic acid have much power in the relief of pain when used alone, unless, as in the case of carbolic acid, they are applied directly to the part affected. Perhaps the condition of pain in the lumbar and other muscles during the attack of influenza is in some unknown way associated with the condition which we have called "rheumatism," and in which salicylic acid does good in an unknown manner. Salicylic acid alone might be equally useful if it were dissolved in the intestine and did not irritate the stomach.

On seeing a case of influenza during the first few hours of the attack, I resort to those remedies which have been in use by the profession for many years, and, so far as I can learn, it is the custom of other members of the profession to give a mixture composed of tincture of aconite, spirit of nitrous ether, and a solution of citrate of potassium in preference to any other medicine at this time. This mixture possesses the advantage of in-

* Read before the Philadelphia County Medical Society, January 13, 1892.

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creasing the action of the skin and kidneys, and of reducing the temperature, of quieting the circulation, and of being readily taken by the patient without danger of disordering the stomach at this time or later on, which is important, as this organ is apt to become irritable. As a general rule, citrate of potassium is given in too small doses, and, unless there are reasons to the contrary, it should be given in the dose of 15 to 20 grains three times a day.

If the fever becomes excessive, so that there is danger of the patient suffering from a true hyperpyrexia, it is my preference to resort to cold bathing instead of the antipyretics I have spoken of. It is true that the patients themselves and the friends of the patients will sometimes protest against what they deem an heroic measure, but I am satisfied that if the cold is used in the proper manner it is devoid of danger to the patient. The majority of physicians, I regret to say, do not seem to carry out the treatment of Brand and Leibermeister as it is carried out by its originators. Most of them forego the very important portion of the treatment, which consists in frictions designed to bring the heated blood to the surface, and I have again and again seen physicians apply cold either by means of a wet sheet, by sponging, or a cold bath without using any measures which are directed against internal congestion.

Hyperpyrexia in influenza does not seem to possess the same dangers that it does in the course of some other diseases. In the first place, as a general rule, the course of the disease is a brief one, and although it may leave the patient weak and exhausted, the actual course of the malady does not extend beyond a few days. Clinical experience and physiological study have proved that it is not the temperature of 105° or 106° F. which is distinctly dangerous, but the continuation of this temperature for many hours, which is harmful. Similarly, a patient ill from typhoid fever, having a temperature of 103°, for many days suffers very much more than does a patient who is suffering from pneumonia, and who may have for forty-eight hours a temperature of 104.5° or 105°. I do not think, therefore, that a temperature of 104.5° or 105° is particularly alarming in the condition which we are considering, unless they are symptoms pointing to the fact that the patient is being injured by an excessive temperature, as may be indicated by somnolence and an exceedingly dry skin, as well as cerebral symptoms. Of course, if renal trouble, associated with cardiac disease, comes on at this time, methods for the reduction of the temperature must be resorted to. The point that I desire to bring out is that the mere existence of high temperature is not to be regarded as a point to which great attention must be given by the use of drugs.

It seems to be the general consensus of opinion, both in this country and in England, that any measures of a *depleting* character are distinctly harmful in influenza, even at its earliest stages, and we would naturally expect that this would be the conclusion arrived at by physicians who treat their patients rationally. Although influenza is a short-lived disease, there is probably no malady which goes on into a condition of profound depression, or even exhaustion, as does this one. The abstraction of blood from a vein, or by the use of cups, should not be resorted to. It may increase the danger from exhaustion before the system has a chance to recover from the simultaneous appearance of the attack and the therapeutic measures of the physician.

As the case of influenza progresses, a condition of marked depression, or even collapse, very frequently develops. The expression of anxiety on the patient's face is to a physician, who is accustomed to see it in other diseases, a most alarming symptom, and it is not until one has seen it repeatedly in influenza that he is able to give it its exact value. Associated with this condition, the skin is frequently covered with a profuse perspiration and the pulse is very apt to be very rapid, running, feeble, and easily compressed. At first glance the old saying, that "we treat the symptoms as they arise," would seem to cover to a very large extent the indications which are present at this period; yet it has been my experience, which may differ from that of some of my hearers, that the cardiac stimulant which we are most frequently accustomed to use—namely, digitalis—does not seem to *take hold* of the circulatory apparatus and to act upon it in the manner which is desired. It may be that the pressing symptoms have made me more anxious and impatient as to the use of my medicament, and that I have not had the patience to wait and allow such a slowly-acting remedy as digitalis to take effect. Be this as it may, I have come to regard strychnine as infinitely preferable to foxglove when these symptoms appear; and I have been able to prevent their appearance, or at any rate to modify them to a very great extent, by using strychnine in full doses from

the first portion of the stage of depression. I believe that, as a general rule, strychnine is given in very much smaller doses than safety requires, and that in many instances it fails to act because the doses are too small to struggle with the profound condition of exhaustion which is present. In an adult I can see no reason why $\frac{1}{20}$ of a grain may not be given twice or even three or four times in twenty-four hours, and in some cases I have given it every four hours without producing any of the symptoms of an overdose of strychnine. Divided doses are better than a few very large ones.

I do not know of any better illustration of the fact that in some conditions we are to give drugs for *effect* rather than according to customary dose than the employment of strychnine in influenza, and the physician who is timorous in the presence of this frequent complication, depression, certainly increases the patient's danger. As with everything else, the drug should be carefully watched, and at the first sign of muscular twitching, or stiffness at the back of the neck, its administration should be cut down or discontinued. In many instances where the collapse comes on suddenly, the strychnine should be administered hypodermically and followed by full doses by the mouth, in order to keep up the full effect exercised by the drug upon the nervous and circulatory system. In some cases it will be found that the blood paths seem to be so relaxed and atonic that the strychnine is unable to produce a sufficient vascular effect to bring the patient out of his difficulties, and under these circumstances very good results follow the combination of belladonna with strychnine. The belladonna being, as we all know, a powerful vaso-motor stimulant under such circumstances. It also should be given in full doses for effect. As the acute stage of depression passes off the belladonna should be stopped and the strychnine continued alone through convalescence.

Alcohol has not seemed to me to be of much value during the active period of the disease. In milk-punches and eggnogs it is, of course, useful during convalescence. If delirium comes on it has not seemed to be a symptom of very serious character either for immediate results or in influencing the prognosis as to the ultimate recovery of the case, and in cases of pneumonia, complicating grippe, in which delirium was the prominent symptom, it has seemed that delirium is not to be regarded in the same light as similar manifestations complicating ordinary pneumonia or other diseases. The delirium may be either talkative or muttering, but does not in the majority of cases require treatment, passing away with the fever and rarely extending into the stage of exhaustion.

For the irritative cough, steam inhalations, laden in the first stage with benzoin or other innocuous and sedative substances, seem particularly useful. For the bronchitis, which is often present, it is generally sufficient to administer the ordinary mixtures containing ipecac, potassium citrate, in the earliest stages, and to follow them by chloride of ammonium and cubebs in the later stages. I do not think that the compound licorice mixture containing antimony should be given in the second stage of influenza. A complication too apt to occur at this time is œdema of the lung or a wide-spread bronchitis with a profound exudation which bids fair to drown the patient in his own secretions. Antimony is not only a substance depressing to the circulatory and respiratory systems, but aids very materially in causing the peculiar variety of secretion which I have just spoken of.

It may be necessary to use bromides if the cough is excessive, or to replace them by codeine, or very small doses of morphine. In many cases still better results will be obtained by a good preparation of cannabis indica, which may be pushed until it relieves the cough, without in any way endangering the patient's life, a safety which cannot be obtained by the employment of any other of the drugs named.

If sleeplessness is so pressing a symptom as to require attention, the bromides may be given, but it will be generally found that the insomnia comes after the attack rather than during it, or in any event it will not require attention until the patient is convalescent. Under these circumstances chloral or chloralamide, or even sulphonal, may be administered, care being taken, of course, in the case of chloral that the cardiac apparatus is in good condition, and in the case of sulphonal that it is administered in a powdered form, or dissolved in hot water and given four or five hours before the time at which sleep is desired.

For the vertigo and dizziness which are sometimes bitterly complained of by the patient, either during or after the attack, small doses of bromide with ergot or cannabis indica have seemed particularly valuable, probably

because they exercise some effect upon the blood-vessels of the brain or its membranes, or perhaps upon the blood-vessels of the ear. Certain it is that in those cases of tinnitus not associated with organic change in the aural canals, bromides and ergot do more towards relieving them than any other medication with which I am acquainted.

In the constipation which is sometimes present in the early stages of influenza it is generally advisable to administer either castor oil, or in other cases half an ounce of the sulphate of magnesium, or for more fastidious patients the citrate of magnesium. A full purgative effect of any of these salines seems to lessen the fever and unload the bowels. Care should be taken that the dose of the purgative is not excessively large, as it will weaken the patient as much as would bleeding. For the constipation following the attack, probably no drug is as efficient as cascara sagrada, combined perhaps with aloin. If diarrhœa supplants the constipation, the ordinary astringents, such as aromatic sulphuric acid or hæmatoxylon, will be found sufficiently active.

I realize very thoroughly that in the short space which I have occupied it has been impossible for me to do anything more than to pass over in a very superficial manner the treatment which is appropriate for the ordinary run of cases. The complications, or intercurrent affections, which are constantly endangering the patient's life, are so various and their manifestations in many cases are so peculiar that it is not possible for any one, even in a very lengthy paper, to direct attention to a line of medication which should be employed in every case. I wish to say distinctly that should the condition of bronchial effusion take place, which I have already spoken of, I believe very firmly that the best treatment that the physician can employ would be the use of the full doses of strychnine already spoken of, as I have seen a number of cases in which the pulmonary structure seemed so completely saturated by a sero-mucous exudate that from the physical and other signs a fatal issue seemed almost certain. In every one of the cases where this complication has been present, strychnine, actively pushed, has resulted in the patient meeting the emergency and ridding his lungs by cough and increased cardiac action of the liquid which threatened him.

The condition of pneumonia is one of engorgement rather than consolidation.

222 South Fifteenth Street, Philadelphia.

REPORT OF CASES OF POISONING FROM EXALGINE, CANNABIS INDICA, ARSENIC, AND CAMPHOR.

By D. W. Prentiss, M.D., Washington, D.C.

CASE of Exalgine Poisoning from Overdose taken by Mistake.—Ten centigrammes (1⅔ grains) were ordered every half-hour, and 40 centigrammes were taken instead every half-hour until four doses or 1.60 grammes (24 grains) were taken in two hours.

Dr. S., aged about 25 years, generally in good health, consulted me April 15, 1890, for severe headache, from which he had been suffering for several days. Digestion was impaired and the bowels were constipated.

I prescribed a mixture of Fowler's solution, bismuth, and pepsin, together with a suitable diet, and gave strychnine, aloin, and belladonna pills for the constipation.

Two days later, April 17, he again called at my office and stated that his headache was no better. I ordered 1 gramme (15 grains) of phenacetin in three doses, a dose every three hours until relieved.

This also failed to give relief, and the next day, April 18, he remained in bed and sent for me. At this time I prescribed,—

℞ Exalgine, 1 gramme;
Sacch., 1 gramme.
In ten powders.
Sig.—One to be taken every half hour, until relieved.

This prescription was compounded at the nearest drug-store, with the result that one *drachm* of exalgine instead of one *gramme* was put up, making each powder contain over six grains instead of ten centigrammes (1⅔ grains).

The rest of the story I let the patient tell in his own words. Suffice it to say that the case developed into one of typhoid fever, and, on account of his unfavorable surroundings in a boarding-house, I had him conveyed on the 22d of April to the Garfield Hospital, where the disease ran a favorable course to recovery in the usual time.

Report of Dr. S.—I was taken sick last spring with typhoid fever, and as a consequence experienced the usual symptoms attending the invasion of that disease,—viz., lassitude, loss of appetite, disorders of the intestinal canal, and headache, the latter becoming the most prominent of all, and calling for immediate treatment.

The day before being confined to my bed I consulted Dr. Prentiss for relief of my head

symptoms, and he prescribed phenacetin in 30-centigramme doses every three hours. I took the three doses ordered without, however, feeling the slightest appreciable effect; in fact, I gradually became worse, so that the next morning I was unable to leave my bed.

My headache proving more excruciatingly painful, I sent for the doctor, who, on finding me worse than the day before, ordered another drug, exalgine, in 10-centigramme doses, with an equal amount of sugar.

He left the prescription to be filled, and at noon it was taken to the nearest drug-store and there put up. The druggist, as it was afterwards ascertained, mistaking the metric formula 1 gramme for *one drachm*, made the doses four times too large. I took the first powder at 1 P.M., to be followed by the others every half-hour as directed.

This I did until the fourth dose was taken, at which time I had experienced no amelioration in my condition. Being somewhat restless, and thinking a change of posture would relieve me, I arose from bed and stood for a few moments leaning my head against the mantelpiece. I had stood there but a few minutes when I felt a gradual but marked sensation of weakness come over me, and I hurried back to bed. I had scarcely touched my pillow before I became aware that it was something more than a mere fainting attack, and that I might become alarmingly ill. I sprang from my bed, rang the bell, which was several feet away, and had just strength enough left me to get back to bed. I was now utterly exhausted; my heart was beating at a tremendous rate, though full and strong, and a profuse perspiration broke out, particularly over my face.

So far as I can now remember, the action of the heart kept on increasing every minute during the half-hour's attack, but I cannot positively state that. Certain it is, it did not lessen, and although I had no means of ascertaining the pulse rate, I have no hesitation in saying that it must have reached as high as 160 or 180 per minute, and probably even higher. All this time I was growing weaker, and a sense as of approaching death came over me. The servant-girl, after telephoning for the doctor, returned and stood fanning me and wiping the perspiration from my face. Of course, what effect the drug had on my countenance I cannot say, but, as the girl afterwards declared that she expected me to die every minute, it is probable that my features portrayed the general exhaustion of my system. This, however, must be taken for what it is worth. I continued in this state for a full half-hour, as it was 2.45 when I rang the bell, and nearly 3.30 before the doctor arrived.

However, I took a tablespoonful of whiskey, and whether it was this stimulant or whether the effects of the drug were beginning to pass away I know not, but when the doctor came my pulse-beat was much reduced, perspiration had ceased, and though still very weak the effects of the drug had about passed away. I had almost forgotten to state a very important clinical fact connected with the action of this drug. Directly after the system was under the full effects of the drug, my headache, intense and severe as it was for fully twenty-four hours before, suddenly ceased, and I was free from this painful symptom during all the time I was under the influence of the drug; after it had fully passed away the headache returned, but in a milder form for a whole day. After this it came again with nearly the old-time severity, continuing for a week thereafter. At the end of that time it quite left me, and I was troubled no more with it during the rest of my sickness.

Note by Dr. Prentiss.—The call which I received was a very urgent one, it being stated that the patient was dying.

Dr. W. K. Butler happened to be in my office at the time and went with me. We found the patient in the condition he describes, almost in collapse, with a rapid, feeble pulse, cold sweat, pinched expression of face, and great exhaustion. Under the free use of stimulants he soon rallied.

I called for the powders and at once noticed that they were much larger than had been ordered, and took them to the drug-store where they had been compounded and had one weighed. It weighed twelve grains. On questioning the druggist, he acknowledged he had put up one drachm instead of one gramme in ten powders.

Case of Intoxication from a Comparatively Small Dose of Cannabis Indica.—Dr. L., dentist by profession, aged 34 years, nervous temperament, was suffering from an irritable cough which prevented sleep at night.

He was directed to take 5 drops of Parke, Davis & Co.'s normal liquid of cannabis indica at bedtime.

The cough becoming troublesome, however, in the afternoon he took the 5 drops at three o'clock and began to feel the effect of it at five o'clock, and at six o'clock I was

telephoned for in great haste, as it was stated that he was very ill.

When I reached the house I found him in bed, oblivious to all surroundings, being vigorously rubbed by several attendants, and evidently excessively happy. He would sway back and forth and laugh until the tears ran down his cheeks, then drop back on the pillow with an expression of heavenly ecstasy on his face.

I reassured the family that there was no danger, and prescribed bromide of potassium.

Desiring to know what the visions were that made him so happy, I shook him up roughly and shouted in his ear, to be sure and remember what he was seeing, that he must tell me about it in the morning.

The condition of ecstasy lasted until nine o'clock, when he fell asleep and slept soundly all night.

The next morning I questioned him about his visions. He said he was conscious of my demand that he should remember what was pleasing him so much and he tried to do so; but the visions followed each other in such quick succession that he could only remember a small portion. He had no unpleasant sensations, all were agreeable.

When the medicine began to take effect, it appeared to come over his senses in a succession of waves until he lost himself.

One of his hallucinations was that the words he tried to say were immense entities, tangible, swelled up in his mouth so that he could not get them out, had to push them out bodily with his tongue; it seemed an hour between each word. Another hallucination was that he was moving through space with lightning speed, and in his path were clouds of the most beautiful, ever changing colors, and when he touched them, each one played a beautiful tune. Being a musician himself, he tried to fix some of the tunes that he might reproduce them, but the succession was so rapid that it was impossible.

Another idea was that his nose was of enormous size and extended down to his knees. When he tried to use his handkerchief, he reached down between his knees to wipe the nose, and an attendant was obliged to take his hand and guide it to the right place.

Another hallucination, the one that caused most hilarity, was an avenue of bottles, a row on each side, standing on their corks, all sizes and shapes,—long, slim bottles, stout pot-bellied bottles,—large and small,—all intent upon dancing comic jigs and trying to climb on top of each other. He was passing between this row at an immense speed, and their performance took place as he passed. This, together with the big nose, was what caused the immoderate laughter.

The idea in his mind was that these performances had been arranged for his exclusive amusement.

The next day he had fully recovered from the effects of the drug.

Case of Arsenic-Poisoning by the Introduction of Paste of Arsenic and Creosote into the Ear for Earache.—Miss J., 32 years of age, was taken with earache May 25, 1890, for which she dropped into the ear a solution of equal parts of glycerin and laudanum. This not giving relief, she remembered a little bottle of creosote and arsenic, left in the house by a relative who was a dentist, and which she had a short time previously used successfully for toothache.

She reasoned that if it would cure toothache, it ought to cure earache, so she got the bottle, took out a portion about the size of the end of her finger (I should think one gramme), mixed it with glycerin, and poured it in the ear.

There was immediately burning pain, the meatus and external ear swelling and becoming inflamed.

It was supposed that an abscess was forming, and that it would soon discharge, giving relief.

I did not see the case until May 29, four days after the poison had been applied.

When first seen, a slough had formed, involving the whole external meatus, all of the external ear, except a small portion of the helix above. Anteriorly the slough extended for half an inch over the tissues in front of the ear. The slough was grayish white, firm, and while a line of demarcation formed, the slough showed no disposition to separate.

She suffered severely from neuralgic pain in the temple, brow, and ear.

There was almost complete paralysis of that side of the face.

She was under my care from the above date, May 29, until July 15, when she died.

The symptoms, in addition to those just stated, were vomiting and purging, pain in the abdomen and great prostration.

The treatment was nourishing diet, stimulants, and opium to relieve pain.

Local treatment consisted in poultices of charcoal, irrigation with hot water, and later a powder of boric acid, bismuth, and morphine.

The pulse, which at first was but little accelerated, became quicker and quicker as

the exhaustion became marked. There was very little rise of temperature.

On June 16 the pulse was 120 and the temperature 99° F. Towards the last she sank into a condition of coma.

July 10.—The pulse was 54.

July 13.—The pulse was 60.

July 14.—The pulse was 136.

July 15.—Died, having been comatose for nearly a month.

Poisoning by Camphor.—M. C., a healthy girl, 11 years of age, called at a drug-store and asked for something to cure a cold.

She was given 5-grain camphor pills, with instruction to take one every two hours.

She took one at nine, one at twelve, and one at two o'clock.

Fifteen minutes after the last one she was sitting on a piano-stool, when she fell backward in a convulsion.

Shortly after, she vomited, the ejecta having a strong odor of camphor. The convulsions recurred soon after she was put to bed.

There was headache both before and after each convulsion. The pulse was weak.

She was given bromide of potassium and elixir of calisaya, and she made a rapid recovery.

This case is of interest, as showing that camphor is not the innocent drug it is popularly believed to be, but is capable of producing poisonous action even in comparatively small doses.

I have notes of another case, where a woman took two teaspoonfuls of spirits of camphor to produce abortion, with the effect of causing convulsions and likewise abortion. She had a narrow escape with her life.

1101 Fourteenth Street.

INTRATHORACIC SURGERY.

Willard (*American Journal of the Medical Sciences*, vol. cii., No. 6), after a detailed account of experiments conducted for the purpose of discovering whether or not bronchotomy through the chest wall is feasible for the removal of foreign bodies impacted in the bronchi, and after a careful consideration of a case of foreign body treated by this operation, comes to the following conservative conclusions:

1. The bronchus in dogs can be reached either anteriorly or posteriorly through the chest walls, but the anatomical position is in such close proximity to large and important structures that safe incision is a matter of extreme difficulty and danger.

2. Bronchotomy through the walls of the thorax is an operation attended with great shock from collapse of the lungs, and, until technique is further advanced, is liable to result in immediate death.

3. Collapse of the lung is more serious in a healthy organ than in one previously crippled by disease.

4. The serious inherent difficulties are shock, suffocation from lung collapse, enormous risks of hemorrhage from pulmonary vessels, injury of or interference with the pneumogastric, great and fatal delays owing to the exaggerated movement of the root of the lung caused by the excessive dyspnœa.

5. Closure of the bronchial slit is slow and dangerous. To leave it open causes increasing pneumothorax by its valve action, and also permits the entrance of septic air into the pleural cavity.

6. Although a foreign body can be reached by this route, yet removal is hazardous. To secure a subsequent complete cure seems in the present state of knowledge very problematical.

7. When the presence of a foreign body in the bronchus is definitely determined, and primary voluntary expulsion has not been accomplished, there is great danger in permitting it to remain, even though it may but partially obstruct the tube. The risks both of immediate and of subsequent inflammation are serious.

8. Low tracheotomy is, then, advisable when the presence of a foreign body is certain; it adds but little to the risks and affords easier escape for the object even when extraction is not feasible.

9. *Subsequent dangers arise from severe and prolonged instrumentation, not from tracheotomy.*

10. Voluntary expulsion is more probable after than before tracheotomy.

11. Tracheotomy is permissible even after an object has been long in position, unless serious lung-changes have resulted.

12. The question of tracheotomy will depend largely upon the form, size, and character of the foreign body.

13. The term bronchotomy should be limited to an opening of the bronchus, and should not be employed to designate higher operations.

14. The risks from thoracotomy and bronchotomy following unsuccessful tracheotomy are much greater than the dangers incurred by permitting the foreign body to remain.

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Leading Articles.

THE USE OF BICHLORIDE OF MERCURY IN THE TREATMENT OF OPHTHALMIA NEONATORUM.

COHN (*Lehrbuch der Hygiene des Auges, erste hälfte*, Wien, 1891), after an excellent chapter on the ocular inflammations of the newly born, exclaims somewhat as follows: "If the prophylactic rules which have been mentioned in the previous chapter were exercised in the case of all mothers and all newly-born children, it is quite certain that no eye would be lost on account of blennorrhœa, and that hygienic measures would deserve the thanks for these brilliant results; that in Europe every year there would be thirty thousand fewer blind people; that in the blind asylums one third of the inmates would disappear; and that over one hundred thousand persons, who, as the result of blennorrhœa, have sustained more or less damage to their visual acuity, would have full sharpness of sight. Truly a state of affairs worthy of the labor of the noblest!" This quotation, somewhat freely translated, is, perhaps, as forcible a statement as could be made in regard to the value of *prophylactic* measures.

But if prophylaxis fails, or if the disease develops because this has been neglected, a consideration of the *curative* procedures is of paramount importance. Probably no one at the present time will dispute the fact that the successful treatment of ophthalmia neonatorum depends upon (*a*) the reduction of the inflammatory swelling of the lids; (*b*) the cleansing of the conjunctival cul-de-sac; (*c*) the use of a germicide which is free from deleterious effects upon the cornea; and (*d*) the instillation of those drugs which exert a favorable influence upon corneal ulceration, should this complication arise.

In a paper recently read before the County Medical Society of Philadelphia, Dr. T. B. Schneideman advocated, among other remedies, the frequent irrigation of the conjunctival cul-de-sac with a solution of bichloride of mercury, 1 to 2000, and reported excellent results. In almost every text-book, and in almost every communication that has appeared upon this subject in recent times, and, indeed, in times that are no longer recent, sublimate solution, in some form or other, and in some strength or other, has been recommended. In the early days it was employed because clinical observation seemed to give to it a distinct value. In recent times its use has been based largely upon belief in its strong germicidal properties. This is not alone based upon clinical observation. Even in the strength of 1 to 10,000 it is said to materially retard the vitality of the gonococcus. Experimenting upon the staphylococcus pyogenes aureus and the typhoid bacillus, Weeks found that their vitality was destroyed in exposures of ten seconds to bichloride of mercury, 1 to 500; in exposures of forty-five seconds to bichloride of mercury, 1 to 1000; and in exposures of ninety seconds to bichloride of mercury, 1 to 2000. Hence there is strong experimental evidence in favor of sublimate solution in the treatment of a disease which owes its virulence to a certain variety of bacteria. Further confirmatory evidence might be obtained from an analogous use to which this remedy is put by the genito-urinary surgeons, and its property of staying the discharge in specific urethritis,—a disease depending upon the same micro-organism for its existence as ophthalmia neonatorum.

Unfortunately for the line of argument, the

conditions in ophthalmia neonatorum, or in purulent ophthalmia of the adults, usually called gonorrhœal ophthalmia, do not permit bichloride of mercury to exercise freely the germicidal value which experience and experimentation have abundantly shown that it possesses. In the first place, the gonococci of Neisser are contained within the living cells, and more than this, owing to their peculiar penetrating properties, they pass deeply within the conjunctiva and even into the lymph-spaces of the subconjunctival tissue. It is unlikely that sublimate solution in ordinary strength, or in a strength suited to the eyes, under these circumstances, can come in contact for a sufficiently long time to exercise a distinctly depressing effect upon the vitality of these cocci. More than this, it has been stated that bacteria in the presence of albumin have the power to reduce this substance to calomel, and thus materially lessen, if they do not destroy, its properties.

But for the moment admitting that these are minor considerations, and perhaps unproven, and granting the great value of clinical observation on these points, the most important objection to the use of this drug in strong solution (*e.g.*, 1 to 2000, or even 1 to 3000) is the unfavorable influence which it may exert upon the vitality of the cornea. It is well enough to employ a drug which kills the bacteria, but it will not do to employ one which does this at the expense of the life of the cornea. Recent investigations have shown that bichloride of mercury (1 to 5000) is able to produce parenchymatous keratitis even in a normal cornea, provided it is applied after this has been incised and the anterior chamber opened. Now, in ophthalmia neonatorum the resisting power of this membrane is materially lessened, and consequently its power to withstand the irritating influence of any drug is proportionately decreased. It is of the utmost importance to keep the epithelial covering intact, and thus prevent the formation of ulcers. It is possible that bichloride of mercury in strong solution is capable of injuring the surface of the cornea sufficiently to bring about an untoward result of this character, and, as there seems to be some doubt (and probably well founded) that it exercises an efficient germicidal influence, under the existing circumstances, it is pertinent to inquire why should it be used at all, or, if it is used, why should it not be employed in very weak solution, and simply with the hope of acting as a well-conditioned cleansing agent.

After all, if destruction of the gonococci is accomplished by any of the various remedies which are introduced into the conjunctival sac during this disease, it is probable that nitrate of silver (almost universally used) accomplishes this feat. It is true that this drug, in spite of powerful germicidal properties, cannot pursue the gonococci into the subconjunctival tissue, but it destroys the superficial layer of epithelial cells in which some of them are contained, and, in addition, exercises a valuable astringent and alterative effect. Moreover, it can be applied to the diseased surfaces without coming in contact with the cornea.

In point of fact, getting rid of the secretion by irrigation, which for the most part must be intrusted to attendants, and which is a most important part of the treatment of this disease, is simply a preparation of the inflamed conjunctiva for a topical remedy which is believed to exercise more or less of a specific action. If the surgeon chooses he may employ bichloride of mercury for this purpose and apply it only to the conjunctiva, as is done in some clinics with good success, and not in the form of copious irrigations. Even boracic acid solution, which is practically without germicidal value, and which is of very indifferent antiseptic properties, has the advantage of being a good cleanser and is slightly astringent; hence, if it is used with this idea in view, and not to the exclusion of nitrate of silver or some other remedy of like action, it has a useful place in the therapeutics of this disease.

It may be objected to the views which have been expressed in regard to the action of bichloride of mercury and its probable deleterious influence upon the cornea that the drug is used with brilliant results in the treatment of allied conditions,—*e.g.*, granular lids; used, moreover, when the cornea is softened and even ulcerated. Under these circumstances, however, the discharge, if present, is less virulent, the cornea has become inured to the presence of irritating influences, the vitality of the membrane is not in an equivalent stage of depression, and irrigations and local applications are made with much less frequency, and consequently exert a less depressing influence.

The whole point of the matter, and the whole idea of this communication, is to enter a protest against the belief that the use of bichloride of mercury lessens the physician's responsibility, because he has employed a drug which rejoices in a great germicidal

reputation. He must not rest satisfied with this. He may employ it, indeed, he should employ it (in the judgment of the writer, in weaker solutions than have sometimes been advocated), but he should not neglect other methods, because he has introduced, or caused to be introduced, into the conjunctival cul-de-sac a remedy the exact physiological action of which, under these conditions, is not accurately determined; a remedy, moreover, in regard to which there is a good deal of evidence to show that it may act as a double-edged tool.

THE TREATMENT OF ASTHMA.

THE questions as to the etiology and pathology of this strange affection have been so thoroughly discussed by clinicians, physiologists, and pathologists that there is little more to be said, unless something definite can be stated in place of the numerous hypotheses which each writer has advanced. The truth is gradually dawning upon many in the profession that asthma is a symptom, not a disease, a manifestation of functional or organic disturbance in the nervous system, in the upper air-passages, in the gastro-intestinal canal, or even in the kidneys, bladder, or uterus. As a result of this conclusion physicians no longer rest satisfied with simply prescribing for the asthmatic attack, but endeavor at the same time to discover and remove the cause which, however remote it may be, can generally be discovered by careful investigation. It is not the purpose of this article to call attention to the methods by which we proceed in the discovery and treatment of the exciting causes of asthma. Regarding the treatment of the case as consisting in a double line of procedure, we shall devote ourselves to the consideration of the care of the patient during the paroxysm, or just when a paroxysm is feared to be approaching.

It having been proved by C. J. B. Williams that the minute bronchial tubes contain as many, if not more, muscle-fibres as the larger ones, the question as to the possibility of there being a distinct contraction of the air-passages is assured. Stoerk and other clinicians have found that hyperæmia of the bronchial tubes is always present when asthmatic attacks occur, and still others have demonstrated the fact that the muscles in the walls of the tubes and the bood-vessels of the mucous membrane are governed by the anterior and posterior pulmonary plexus, which are made up of branches of the pneumogastrics, recurrent laryngeals, spinal nerves, and ganglia from the sympathetic system. Branches from these plexuses form a net-work about the bronchioles and contain ganglia. Reflex activity can therefore play an important part in the causation of asthma, and those remedies which decrease reflex activity and depress the vagus nerve or its terminal branches are nearly always indicated. It is for these reasons that belladonna has been so long a favorite drug for the relief of asthmatic attacks, since it depresses the power of the vagi. In a similar manner is relief brought about from the administration of lobelia.

Within the last two years another remedy for asthma has been introduced into medicine,—namely, euphorbia pilulifera, the mode of action of which is almost unknown. Empirically, however, it has been found of service in asthma, and it may be employed alone or in combination with several of the depressants to the pneumogastric nerve, in a prescription made up as follows, which is most readily given in a compressed pill or capsule:

℞ Extract. Euphorbiæ piluliferæ, ♏iii;
Nitroglycerin, gr. $\frac{1}{200}$;
Sodii iodidi, gr. ii;
Potassii bromidi, gr. ii;
Tr. lobeliæ, ♏ii. M.

Sig.—To make one dose, which may be doubled or tripled, and used three times a day.

It will be seen that in this prescription we have the new antiasthmatic euphorbia, and in addition that powerful depressor of the vagus nerves, nitroglycerin, which at the same time tends to relax muscular fibres which are contracted in spasm. The lobelia has a similar effect on the vagus, and the iodide of sodium exercises the peculiar effect which the iodides possess in altering abnormal secretion, and promoting normal function in the respiratory passages, in so far as secretion is concerned. Finally, the bromide tends to decrease reflex activity and so to lessen spasm in addition to quieting nervousness and relieving insomnia. The nitroglycerin is used in the comparatively small dose, in order to allow of the increase in the dose of the other constituents, without increasing to too great a degree the dose of this powerful medicament. In obstinate cases, the euphorbia pilulifera may be given in separate doses to the extent of half to one drachm in addition to the prescription already named.

THE SURGICAL TREATMENT OF TRIGEMINAL NEURALGIA.

TRIGEMINAL neuralgia is, with the perfection of surgical technique and the clinical demonstration of the rapidity and safety with which extensive wounds about the face and head heal, more frequently than ever before referred to the surgeon for final treatment, since drugs are in many cases found futile, and since cases of successful surgical intervention are rapidly multiplying in current literature. The lot of one suffering from this most severe of all pains is such that any risk is justifiable if the prospect of a perfect cure can be held out; indeed, the great majority of these patients prefer death to a continuation of their suffering, often aggravated by the opium habit, the temptation to which is irresistible. The surgical treatment of this form of neuralgia is systematically discussed by Horsley, Taylor, and Colman (*British Medical Journal*, No. 1613, 1891). Their first advice is recourse to drugs. Most confidence is placed in quinine combined with arsenic and gelsemium. Antipyrin and antifebrin are sometimes of service; opium is to be avoided. Chloride of ammonium, aconitine, and counter-irritation over the point of emergence of the nerve or over its course are useful. In some cases the galvanic current relieves the pain. When these measures prove ineffectual, nerve stretching, neurotomy, or nerve-avulsion must be considered. Walsham and Dumont report successful cases of nerve-stretching. The result, however, is not lasting, hence section was combined with the stretching; but since the divided nerves frequently united, and this very promptly, neurectomy would seem to be the best operation.

Considering the first division of the fifth nerve, the supraorbital branch is the one which usually requires operation. The best method of dealing with this nerve is excision. This is carried out by making an incision one inch long just parallel and below the supra-orbital margin. Search is made in the notch or foramen for the nerve; with all its branches it is pulled forward as far as possible, is divided, and the terminal filaments dissected out. The supratrochlear may be dealt with at the same time, since it is easy to follow back the supraorbital to the point where this is given off as one of the terminal branches of the frontal nerve. The supratrochlear may require treatment by itself; in this case its position is indicated by a line drawn from the outer angle of the mouth through the inner canthus to the orbital margin. At this point of the orbital margin it is found as either one or several fine filaments running from the orbit just above the pulley of the superior oblique. It lies deep on the periosteum, and is best exposed by making a half-inch incision crossing its track.

The second division of the fifth nerve passes through the infraorbital foramen, which corresponds with the junction of the inner and middle thirds of the orbital margin, and lies about a quarter of an inch below it.

Agnew, in discussing excision of this nerve, recommends that the operation should be varied in extent according to the extent of the pain. Thus, if the posterior dental nerves are not involved, he would remove only the front of the nerve. The ordinary method of dealing with this nerve is by making an incision parallel to the orbital margin, raising the periosteum from the floor of the orbit, cutting through the nerve as it enters the infraorbital canal and drawing it through the foramen in front.

Where the dental nerves seem to be the origin of the infraorbital neuralgia, Roux recommended raising the buccal mucous membrane, trephining the antrum, stripping off its lining membrane, and then removing the segment of the maxillary tuberosity containing the superior and posterior dental nerves.

Since all these operations are followed by return of pain, Carnochan advises resecting the trunk of the nerve behind Meckel's ganglion. To perform this operation a V-shaped flap was raised. The whole of the anterior wall of the antrum was exposed, the trephine was applied, so that the upper margin of the opening corresponded to the infraorbital foramen, the nerve was separated as far as the posterior wall of the antrum by means of the bone-forceps or the chisel, if necessary, and the spheno-maxillary fossa was thus exposed. The trunk of the nerve was now isolated in the fossa, and the posterior dental nerve and the branches to Meckel's ganglion divided, and the trunk cut close to the foramen rotundum, the nerve anterior to the point of section being removed.

Gerster, too, accomplished a similar resection, performing a temporary excision of the upper jaw. Lucke attained the same object by a temporary excision of the zygomatic arch. He began his incision two-fifths of an inch behind the external angle of the eye and carried it downward and forward to about

the position of the third upper molar tooth. At this position the sharp process denoting the commencement of the zygoma can be felt. The zygomatic process of the malar was sawn through, the zygoma was then fractured posteriorly, and turned upward with the attached fascia, and the spheno-maxillary fossa was opened. The nerve was then cleaned from the infraorbital canal to the foramen rotundum, and this piece was excised. Deformity follows this operation, due apparently to division of the masseter. For the purpose of lessening this deformity, Lossen divided the temporal fascia above the zygoma, and turned the latter, with its attachments, down. After completion of the operation, the fascia is reunited, almost no deformity following.

Horsley believes that in dealing with neuralgia of the second division of the fifth pair, the operation should consist in first protecting the eye from the irritating effect of strong lotions. This is accomplished by passing a horse-hair suture through the skin of the lids. An incision following the lower orbital margin is then made. This is joined at right-angles by a small cut, half to three-quarters of an inch in length, and lying over the position of the foramen. By stripping the periosteum downward the nerve is exposed at its point of exit, together with its artery, and both can be separately secured by a silk ligature. The periosteum is next detached from the orbital floor. If it be preserved intact, the fat filling the cavity, which is often a great hinderance to the operation, is entirely kept out of the way. Next the foramen is opened by a sharp pair of bone-forceps, and the roof of the canal is detached by means of forceps or a dura mater elevator. The nerve and artery can now be detached for their entire length. In some cases the antrum is necessarily opened; this occasions very slight inconvenience. The bottom of the wound should be filled with boracic powder, when the whole can be sutured, and union obtained by first intention.

The inferior dental nerve is the branch of the third pair most frequently affected by neuralgia. The lingual, the buccal, and the auriculo-temporal nerves are also involved at times. The two latter are readily reached, the former by dividing the mucous membrane from the mouth opposite the middle of the ascending ramus of the jaw, and the latter as it crosses the zygoma between the temporal artery and the pinna of the ear. When the inferior dental is attacked, the nerve may be reached from the mouth or from the outside, either as it enters the canal or after it is in it, or it may be sought at the base of the skull. The operation upon the mouth is carried out by opening the jaws widely, by incising the mucous membrane for an inch along the anterior border of the ramus of the lower jaw, by detaching the periosteum and soft parts until the dental foramen is exposed, and finally by seizing the nerve and excising as much as possible. The disadvantage of this operation is that it is quite certain to be followed by the wound becoming septic. The nerve has been attacked before it enters the canal, either by chiselling away the under jaw above the angle or by making an incision around the angle of the jaw corresponding with the insertion of the masseter, and raising the soft parts from the inside until the inferior dental and, in front of it, the lingual can be felt with the finger. Various incisions have been suggested for removal of the nerve in the canal. These vary mainly in the position and extent of the superficial cut. They all consist in removing the bone until the canal is exposed, and excising the nerve to a greater or less extent.

Horsley criticises all these operations on the ground that the nerve is not sufficiently removed between the foramen ovale and the upper end of the inferior dental canal. He has devised an operation which has for its aim the separation of the lingual and dental nerves from their continuation with the main trunk just outside of the foramen ovale, the accomplishing of this without notable scar and without injury to important structures, the bringing of every step of the operation beneath the eye of the surgeon, and the primary union of the wound. This he accomplishes by making an incision beginning above the upper border of the root of the zygoma and carried straight down the front of the tragus, following the contour of the jaw behind the angle forward, just below the lower border of the body as far as the facial artery. The triangular flap thus marked out is then raised, the knife cutting the layer of fat and superficial fascia which lies immediately over the deep masseteric fascia. This flap is drawn forward and upward until the anterior border of the masseter is reached, and the edge of the parotid and the lower border of Stenson's duct well defined. Next the fascia and muscle are divided between Stenson's duct and the highest branch of the facial nerve. The masseteric fascia is split horizontally between them over the whole

breadth of the muscle. The arteries wounded in this cut should be tied. The fascia is then seized by dissecting forceps and undermined all around by blunt dissection. By means of retractors and dissection the opening of the masseteric fascia can be enlarged until it is over an inch in diameter. The parotid gland should be retracted towards the ear, so that the posterior border of the angle of the jaw can be readily detected. The masseter muscle is then divided, preferably with scissors, on the jaw for the posterior two-thirds of its extent. The rapid oozing from muscular branches can be stopped at once by application of small sponges wrung out in very hot lotions. The periosteum of the jaw is then peeled off, together with the superjacent muscle, until the finger and the electric light have rendered evident the sigmoid notch, the posterior border of the coronoid process, and the neck of the jaw. A U-shaped piece is then excised; this consists practically in extending the sigmoid notch down as far as the upper orifice of the dental foramen. This exposes the inferior dental artery and behind this the inferior dental nerve. The internal maxillary is also seen, and, if so diseased that it stands manipulation badly, should be ligatured and divided. The inferior dental nerve is secured by a ligature at its lowest part, and traced upward to the point where it is coming from beneath the external pterygoid muscle. This latter structure is levered upward with the retractors, when the nerve can be followed to within two-fifths of an inch of the foramen. It should then be cut as high as possible and the piece removed. The lingual nerve lies half an inch deeper than the inferior dental, in a line vertical to the ramus, at a point just above the dental foramen. Hence, search must be made for the nerve in the direction thus indicated, unless it is exposed by the previous dissection. The wound is sponged out with warm sublimate solution, all bleeding points, including the smallest, are ligatured with fine catgut and a small drainage-tube is laid upon the bottom of the hole just above the lower angle of the jaw, and the skin edges are carefully approximated with horse-hair stitches. The drainage-tube is removed in twenty-four hours.

Since all peripheral operations have at times been followed by recurrence, Pancoast removed the nerve at the foramen ovale; this he accomplished by dissecting up the masseter muscle, cutting the temporal tendon from the coronoid process, and removing the coronoid at its junction with the ramus; the internal maxillary artery was separated and tied, the origin of the external pterygoid exposed and cut away from the wing of the sphenoid, and the nerve exposed as it emerged from the foramen ovale.

Crédé and Krönlein both advise modifications of this operation. In cases of recurrent neuralgia after peripheral excision, and particularly where the second and third divisions of the fifth nerve were not previously obliterated, Horsley makes a convex flap from the root of the pinna across the temporal muscle, and then joining the ridge and following that down behind the external angular process and margin of the orbit, to terminate just below the middle of the malar bone. This incision is carried down to the bone throughout, except at the fore part of the temporal fossa. The flap is then turned downward, including skin and superficial fascia and fat only, as low as the centre of the zygoma. The deep fascia covering the temporal muscle is then divided by a deep incision running parallel to the upper border of the zygoma and at about two-fifths of an inch from this. The upper part of this is turned up and the temporal muscle exposed. The malar bone and root of the zygoma are then divided by means of an Adams saw. The zygoma is then forced downward, carrying with it Stenson's duct and the branches of the facial nerve uninjured. The upper portion of the coronoid process is then cut off with strong forceps, and may be removed, together with the lower portion of the temporal muscle. The free bleeding is readily controlled by irrigation with very hot antiseptic solutions. The external pterygoid is detached from the sphenoid with the elevator and pushed down until the foramen ovale is completely laid bare. The skull may be trephined and the nerves removed from within, or they may be drawn out and divided.

In spite of this free division of the nerve, it may happen in certain cases that the neuralgia will recur. In this case removal of the Gasserian ganglion may be considered. Dissection has shown that the upper half of this ganglion cannot be stripped from the cavernous sinus without tearing the wall of this cavity; hence it would seem that only a portion of this ganglion can be removed. In an unreported case operated on by Agnew, at the time when the incision for removal of the ganglion was made, there was a sudden protrusion of the eye on the affected side, show-

ing that a blood-vessel of some size was wounded. The patient recovered, and the neuralgia was definitely cured. The cavernous sinus may have been opened in this case. Therefore, in place of excising the ganglion, the operation of dividing the nerve behind the ganglion naturally suggests itself. The fifth nerve enters the dura mater just beneath the edge of the tentorium, and lies in a roomy canal, joining the Gasserian ganglion, which lies in a similar cleft of the upper surface of the petrous bone and on the roof of the carotid canal. In performing this operation on the human subject, Horsley made a large temporal flap, starting from the anterior extremity of the zygomatic process, and running upward to the temporal ridge, following that line and descending along it to the asterion. The temporal muscle was separated from the bone, and the whole of the squamous portion of the temporal bone was taken away by means of a trephine and suitable bone forceps. The dura mater was then opened along the full length of the area of bone removed, and the temporo-sphenoidal lobe thus laid bare. A broad copper retractor, with smooth and everted edges, was then gently slipped underneath the lobe and slowly but steadily raised. By means of electrical illumination the floor of the skull was then easily seen. The guide to the fifth nerve is the upper border of the petrous bone. The edge of the tentorium was defined, and the point at which the fifth nerve passes beneath it was seen in the first case operated upon. The canal was opened and the nerve was exposed. A small blunt hook was passed around it, and it was then avulsed from the pons. The patient perished from shock in seven hours.

Horsley justifies operations on the ground that trifacial neuralgia is a purely peripheral malady, affecting principally the small subcutaneous branches of the nerve, as well as the trunks of the fifth nerve, as they run in the bony canals of the facial bones. The cause of failure after resection he believes is often due to removal of too short a piece permitting of reunion of the cut ends.

Hüter, in an experimental research, showed that to prevent reunion of the divided nerve with certainty no less than five inches must be removed. This Horsley considers an excessive length, although he freely concedes that the nerve may bridge over a considerable space. In one unreported case operated upon by Agnew, one and a half inches of the branch of the trifacial nerve was removed. The pain recurring, another operation was performed, when a fine filament was found connecting the two ends of the divided nerves. This was subjected to microscopic examination, and was found to be made up of true nerve-tissue.

Horsley appends to his paper a table of nineteen cases, some of whom were operated upon two, three, and four times. In the majority the cure was complete, although the period in which these patients were under observation is scarcely long enough to allow positive assertion on this point; thus, his earliest reported operation was in 1886.

He believes that as soon as drugs and electricity have definitely proved unequal to the task of controlling pain, the branch of the nerve affected should be excised. This implies a surgical operation of comparatively slight moment and a slight resultant scar.

Reports on Therapeutic Progress.

PIPERAZIN AS A SOLVENT FOR URIC ACID.

Dr. J. H. Brik says, in the *Wiener Medicinische Blätter*, December 10, 1891, that hard renal calculi and fragments of stone are dissolved with decided difficulty, and may lie for days in a one per cent. solution of piperazin partly undissolved; but if the piperazin solution flows over the concretions in a continuous stream its action is much more marked.

Fifteen grains of piperazin dissolved in water can be detected in the urine in about two hours after having been administered.

Clinical observations upon the employment of piperazin are few as yet. Vogt, of Paris, suggests that in healthy persons under its use the total quantity of urine is diminished about a third, and that, on the other hand, an excess of urea is excreted. Ebstein and Sprague have instituted experiments which have not borne out Vogt's opinion. Drs. Heubach and Kuh detected a slight increase of uric acid in the twenty-four hours. Brik agrees with Ebstein, Sprague, and Heubach that, after the administration of fifteen grains of piperazin, there is an increase in the quantity of urine passed in twenty-four hours. If the administration of the remedy in this dose is stopped, or if it is given in smaller doses, the volume of urine becomes less, so that it fluctuates within nearly normal limits. The specific gravity varies inversely as the quantity. The (acid) reaction is considerably lessened, and, according to Ebstein, at times even be-

comes alkaline. Heubach and Kuh state that it is always acid, and Brik agrees with them.

There was no essential effect of the remedy upon tissue-change. Subjective symptoms did not occur after the use of the remedy. Brik's attempt to test the solvent action of urine containing piperazin by means of Pfeiffer's uric acid filter gave negative results. He thinks with Vogt that the remedy has an antiseptic action.

Brik gave the remedy internally, in the dose of 15 or 30 grains, in a glass of Kroudorf water, or ordinary water, or in the following mixture:

℞ Piperazini puri, gr. xv;
Aq. destill., ʒv;
Syr. aurantii cort., ʒv. M.
Sig.—To be used during the day.

Brik's clinical experience is with ten patients, who passed uric acid in excess. One patient had lithiasis, one nocturnal enuresis, two had uric acid dyscrasia complicating diabetes, and two uric acid calculi. The histories of some of the cases are given in detail. His general conclusions are that piperazin is the best solvent for uric acid. In the uric acid dyscrasia, and in the disturbances and symptoms of disease caused by it, piperazin is the best remedy, especially in beginning and also in progressive renal calculi, and in the nervous disturbances of the urinary apparatus, such as nephralgia, spasm of the bladder, enuresis, which are caused by the above indicated abnormal chemical mixture of the urine.

In vesical calculi from uric acid and their connections, especially if the diameter of the stone is in marked disproportion to the diameter of the urethra, the stone should be removed by operation and then the uric acid dyscrasia combated. In this way the reformation of uric acid stones may be checked.

Piperazin is a valuable remedy, which far surpasses all other solvents of uric acid; it is, therefore, useful as a symptomatic remedy against the excretion of uric acid and the conditions directly resulting from it.

But the uric acid is barely dissolved, and its formation is just as little checked, by piperazin as by the alkalies hitherto used. The bio-chemical processes which cause the uric acid dyscrasia have been so insufficiently investigated that they cannot be directly and permanently influenced by chemical means.

TREATMENT OF WEEPING ECZEMA.

Dr. Leven says he has found a solution of nitrate of silver a sure remedy in those persistent moist eczemas which obstinately resist treatment. The moist spots under the influence of the nitrate of silver skin over quickly and certainly. Such eczemas are observed especially in children in the first months and years of life. He cites the following case: A child, 6 months old, had a weeping eczema of the whole head and face. The face was much reddened, swollen, œdematous in places where the connective tissue was loose, and generally moist. The serous transudation was extraordinarily great in the hairy parts, so that the child's bed was always wet. Itching was intense. After failing with other treatment, Leven used a one per cent. solution of silver nitrate, in the form of an application, a bismuth ointment being used in the intervals. Complete recovery occurred in fourteen days. In a woman, 64 years old, with moist eczema of the scalp, hairy parts of the neck, and ears, the same treatment was followed by recovery in six days.

Leven prefers a one per cent. solution of nitrate of silver applied repeatedly during the day, bismuth ointment being used in the intervals.—*Deutsche Med. Wochenschrift*, November 26, 1891.

HEPATIC COLIC.

Lemoine uses the following methods in the treatment of hepatic colic. If no vomiting is present, he has recourse to ethereal solutions or those containing chloroform, as follows:

℞ Syrupi acaciæ, ʒiv;
Æther. sulphur., ʒi.

Or

℞ Chloroformi, ♏xv;
Tincturæ myrrh., ♏xv;
Mucilag. acaciæ, ʒii;
Syrup., ʒiiiss.

A tablespoonful of either of these prescriptions every fifteen minutes.

If vomiting is a pressing symptom, it is to be arrested by giving small pieces of ice and sedative drinks along with very small quantities of cold beef-tea or milk. A turpentine stupe or other hot application may be applied to the abdomen, which should be covered by a rubber cloth to preserve the heat and moisture. Dry heat may be used in place of moist heat, if desired. Liniments are without effect, and mustard plasters may injure the skin, but prolonged

and very hot baths are of service. Lemoine also uses the following suppositories:

℞ Extract. belladonnæ,
Extract. opii, aa gr. ½;
Olei theobromæ, ʒiss;
Ft. in suppositorium no. 1.

Or

℞ Extract. opii, gr. ⅙;
Pulv. castor., gr. xv;
Ol. theobromæ, ʒi.
Ft. in suppositorium no. 1.

—*Revue Thérapeutique Médico-Chirurgicale*, November 1, 1891.

BENZOSOL.

The substance benzosol has been introduced with the idea of its taking the place of creosote either in the treatment of phthisis or of catarrh of the air-passages. The commencing dose is 4 grains three times a day, with bicarbonate of sodium. The medicine should be administered after meals, and the patient may be gradually allowed to increase the dose until 15 grains are taken without the development of disagreeable symptoms. The treatment decreases the severity of the cough as well as its frequency, and tends to decrease the night sweats and the attendant expectoration. WALZER prescribes it as follows:

Benzosol, gr. iv;
Chocolate,
Sugar, aa q. s. M.
Put in one capsule.

He orders from three to six of these capsules a day. Or benzosol may be combined with peppermint and sugar in the proper quantities, under which circumstances it becomes a useful preparation in the treatment of children.

Benzosol is decomposed in the organism into benzoic acid and guaiacol, and is eliminated by the urine and saliva. If Walzer can be believed, it forms a most agreeable substitute for creosote, and is particularly valuable in phthisis not only for the reasons given, but also because he believes it increases the nutrition of the patient.—*Journal de Méd. de Paris*, No. 48, 1891.

EUROPHEN—A SUBSTITUTE FOR IODOFORM.

Europhen is a very fine, yellow powder, having neither a disagreeable nor a strong odor. It is one-fifth as heavy as crude iodoform, while the finely-powdered iodoform is two and a half times heavier than europhen. It is soluble in alcohol, ether, chloroform, benzine, and in fats and oils (paraffin), some of them taking up equal weights. VULPIUS states in the *Deutsche Medicinische Wochenschrift* (October 29, 1891) that the results of his bacteriological experiments agree in essential particulars with those of Siebel and Goldmann. It was tested upon anthrax bacilli, staphylococcus pyogenes aureus, and the bacillus pyocyaneus. Anthrax bacilli attained a slight growth once, but otherwise they seemed always to be rendered inert. Staphylococci were essentially checked in their development, although perhaps not so much as under the influence of iodoform. Pyocyaneus seemed not to be influenced by europhen. Experiments to determine its toxicity were made upon mice, guinea-pigs, rabbits, and dogs. It proved fatal to these animals in doses of ⅓ of a grain, 30 grains, 45 grains, and 1 drachm, respectively. Vulpius thinks the experiments indicate that europhen is less poisonous than iodoform. He used it locally in the form of ointment, powder, and gauze in fifty cases, and never saw any symptoms of poisoning, nor was eczema produced. The remedy promoted healing of wounds. He thinks his preliminary trials warrant his recommending it when rapid and vigorous granulations are to be excited.

THERAPEUTICS OF VALVULAR LESIONS OF THE HEART.

PROFESSOR LIEBERMEISTER, of the University of Tübingen, takes up this question in the *Deutsche Medicinische Wochenschrift* (November 12, 1891). The treatment of valve lesions, he says, includes the treatment of the endocarditis from which they have arisen. Most valve lesions are incurable. Only in relative and functional insufficiency is a complete cure possible. In these conditions treatment consists essentially in avoiding the causal conditions, especially anæmia or chlorosis, and in improvement of the condition of nutrition of the whole body and the heart muscle in particular.

Although the resulting valve lesions are incurable, their treatment is important, as it prolongs life and enables the patient to enjoy a relatively good and useful existence.

The first effort should be to restore compensation as completely as possible; then to take care that this compensation is maintained; and, finally, if this compensation

becomes disturbed, the effort should be to obviate its bad consequences.

To restore compensation as completely as possible heart gymnastics are recommended by some, especially such exercises as demand active movements of the body, as jumping, mountain-climbing, and the like. Liebermeister regards this advice as preposterous in the highest degree. Hypertrophy, so far as it is necessary for compensation, arises without our effort, and just in proportion to the obstruction in the circulation; more than this does harm, because the more decided the hypertrophy the sooner degeneration occurs.

In the stenoses, until hypertrophy of the section of the heart concerned has taken place, all great demands upon it which the heart is not able to meet at once should be carefully avoided.

The patient is, therefore, to be kept in absolute rest in bed until hypertrophy of the heart occurs. Then the patient may be permitted, as an experiment, to leave his bed. The length of time he can be permitted to remain up can be increased gradually. Light, passive gymnastic exercises, or such as call for resistance on the part of the patient, may then be tried, and subsequently he may be allowed to take a few short steps on the level. Gradually he may perhaps come to take longer walks, and even, though slowly and with pauses, moderate ascents can be made, but so carefully that the patient is not wearied. Every heart patient should clearly understand that he is not fit for a runner, gymnast, and mountain-climber.

If the patient makes it an inflexible rule to stop and rest so soon as palpitation and shortness of breath appear, there will be no danger of his surpassing the limits of safety in his exertions. If his subjective sensations cannot be used as a guide, let him remember that the limit is reached when the pulse rises to 90 or 100 beats per minute. If the patient will not be guided by either subjective or objective warnings, compensation will not long be maintained. Men who keep up by will-power, in spite of evidences of failing compensation, die as a spirited horse dies when driven by an ignorant coachman.

It is of special importance for the restoration and maintenance of compensation that the heart muscle should be as well nourished as possible. A mixed diet, with some preponderance of proteids, is best. For many cases a liberal supply of milk, besides food not too rich in fat and carbohydrates, is advisable. The idea that heart patients should have as small a quantity of fluids as possible is a mistaken one. They may drink as much fluid as they desire. Alcoholic beverages are to be forbidden entirely or to be permitted very sparingly. Coffee and tea are only allowable when taken weak and diluted with two or three times their volume with milk. Iron and quinine may in some cases contribute to the nutrition of the patient.

In summer an elevation of fifteen hundred to three thousand feet and forest air are to be recommended, while in winter a climate which permits the patient to be frequently in the open air is best. In patients with excited or excitable hearts, tepid baths (88° to 90° F.), not lasting too long, do good. Baths holding salts, and especially the thermal salt-water baths of Manheim, which are rich in carbonic acid, have proved useful.

If a disturbance of compensation has occurred, and swelling of the liver, lessening of the secretion of urine, dropsy, cyanosis, and dyspnœa appear, then the outlook for the future is less favorable. But we are still able in not a few cases to restore compensation and to maintain for a long time a moderate working condition. This is attainable more frequently in mitral lesions, especially mitral insufficiency, than in aortic lesions. The most important measure in every disturbance of compensation consists in lessening the demands upon the heart to the smallest degree possible. Patients must lie in bed for a long time. This alone will frequently achieve the desired object. Gradually compensation is restored, and the patient can again be permitted to get out of bed, and subsequently, after suitable caution regarding any occupation bringing a strain upon the heart, go about his business. As an instance of the benefit following long rest in bed, Liebermeister mentions the case of a man who was in the habit of going to bed for several weeks when compensation was disturbed, and then getting up and going about, perhaps too soon. One day he fell and broke his thigh, and consequently was compelled to remain in bed for a long time. Liebermeister speaks of the accident as the greatest good luck to the man, as he is still active in his business, though more than fifteen years have elapsed since the first disturbance in compensation occurred.

In the medical clinic at Tübingen two hundred and ninety-one cases of valvular lesions of the heart were treated in the twenty years from 1870 to 1890; in two hundred and thirty of the cases there was disturbance of com-

pensation. In one hundred and thirty of the latter an expectant treatment of rest in bed and suitable diet, without drugs, was tried. In eighty of the latter cases this treatment sufficed to restore compensation completely and for a long time. In twenty-three of the cases the result was only transient, and in twenty-seven cases drugs had to be resorted to, because expectant treatment alone did not succeed.

Drugs are to be used when rest in bed does not suffice to restore compensation, and in all cases in which the disturbance is so grave that any delay might be dangerous. Digitalis is the principal heart remedy. Its effect is only transient; under favorable conditions it may last three or four weeks, or even longer; under unfavorable conditions it may pass away in one or two weeks. It should not be repeated too soon; a full digitalis effect can be counted on only when four weeks have elapsed since the last employment of it. Hence the need for as complete and as enduring an effect as possible. To this end the demands upon the heart must be lessened as much as possible. Liebermeister says he never prescribes digitalis unless he is certain that the patient will remain in bed until full action of the drug is obtained. Even if digitalis restores compensation, patients in whose case it is doubtful whether compensation will last four weeks must still remain in bed. Each lengthening of the compensation beyond four weeks is a gain for the patient and improves the prognosis. The dose of the infusion of digitalis required to obtain a full effect is half a teaspoonful to a teaspoonful and a half. When digitalis is employed in substance, the dose is from 12 to 22 grains in the course of three or five days, because the active constituents of digitalis are not quickly excreted. Its administration is stopped as soon as the secretion of urine exceeds two or three quarts, or if the frequency of the pulse is considerably lowered, or if any disagreeable effects from digitalis is experienced. It should not be given in the intervals, because small doses do no good, and they have the disadvantage of accustoming the person to the drug.

Between 1870 and 1890, in the Tübingen clinic, ninety-four cases of valvular heart-disease with disturbed compensation were treated with digitalis. In thirty more cases it was employed after the expectant treatment failed. Of these one hundred and twenty-four cases, in sixty-one a complete and lasting result was reached, in forty cases a transient result, and in twenty-three no result.

Digitalis fails sometimes because the valve lesion has reached such a high degree that for mechanical reasons a restoration to an approximately normal circulation is impossible, and sometimes because degeneration of the heart-muscle has advanced too far.

When digitalis fails, there is a series of remedies which may in individual cases remove dropsy and improve compensation. Some of these appear to act similarly to digitalis, and others excite the kidneys to greater secretion. To the former class belong tincture of strophanthus, in doses of 5 to 10 drops three times daily, and the preparations of convallaria. Of remedies acting upon the kidneys, calomel is to be mentioned before all others; in doses of 3 to 4½ grains two or three times daily it is an excellent diuretic. Less active diuretics in heart-affections are squill, and the tartrate, borate, and acetate of potassium. Caffeine acts both upon the heart and upon the kidneys, and in the form of the sodium salicylate or benzoate is employed in doses of 5 to 10 grains once or twice daily. Other remedies with similar action are diuretin and adonis vernalis and æstivalis. Unfortunately, the action of all these remedies is less certain than that of digitalis.

Hydragogue remedies are still more uncertain. In many cases mild purgatives are suitable. In some cases diaphoresis is successful. It should be obtained by putting the patient in a warm bath, and gradually raising his temperature; after removing him from it, he should be covered with previously-warmed woollen bed-clothing. His temperature should not be raised at most above 102.2° F. in the mouth. Paracentesis or funnel-drainage may be necessary to evacuate dropsical effusions. In a few cases it is possible, by lessening the quantity of fluid ingested to diminish the dropsy.

In special cases other measures are helpful. It is often useful in patients with very excited heart-action to employ cold applications to the præcordia, or an ice-bag, but only for a short time. It is also possible at times to quiet the heart-action by lukewarm baths. In failing heart, stimulants may be demanded, and the best are alcohol, camphor, strong coffee with rum or cognac, and hypodermic injections of camphorated oil or ether.

In very severe disturbance of compensation, if all other means fail, free blood-letting has often a favorable effect. It relieves the over-distended auricle and ventricle, and

lessens the volume of blood which the weakened heart has to propel. This measure, Liebermeister believes, is employed too seldom. Threatened œdema of the lungs is an indication for venesection. Usually also threatened cerebral hemorrhage is suggested as an indication, but it has more theoretical than practical value, because a brain hemorrhage can only rarely be seen. Another indication for bleeding is a stasis of blood in the cerebral veins, causing œdema, and still another arises when digitalis and the other remedies fail. It is indicated the more the visible veins are distended and the deeper the cyanosis. It is indicated, finally, in patients who come under treatment with so decided a lessening of circulation that there is no time for digitalis or other remedies to act.

METHÆMOGLOBINURIA.

The first mention of a secretion of dark urine following the administration of the salts of quinine was made by a physician of Guadaloupe, Dr. DuChassaing, and later by physicians in Greece and Italy, which have been more recently confirmed by a great number of French observers. It has been found that the manifestation of hæmoglobinuria after the use of quinine depends upon a special predisposition to the drug or to an idiosyncrasy which affects members of the same family. Its appearance is very rapid after the administration of the medicament, but its duration and intensity is variable, according to the size of the dose and the degree of susceptibility of the patient. In many respects the attacks are closely analogous to those seen in malarial poisoning, the urine having the peculiar color of methæmoglobin, which a spectroscopic examination shows to be present. All of the salts of quinine are capable of producing this symptom, the rapidity of the action being somewhat governed by the readiness with which they are dissolved, and it is a point worthy of notice that muscular fatigue, febrile reaction, or a chill are powerful adjuvants of this peculiar effect. The prognosis in general is favorable and is never grave except after the administration of massive doses of quinine, when profound alterations may be found in the blood, and such an accumulation of methæmoglobin may take place that it is impossible for the kidneys to eliminate it, or for the liver to act properly, and as a consequence of this there is danger of biliary intoxication consequent upon the primary symptoms.

Carreau, who writes on this subject, warns physicians against the reckless employment of quinine in its various forms without carefully examining the history of the patient in order to discover any idiosyncrasy, and recommends that as the condition is perhaps due to a lack of alkalinity in the blood that it may be well to administer, before the quinine is given, full doses of bicarbonate of sodium. For the icterus, which is sometimes produced, recourse must be had to the oil of turpentine and the general treatment which is employed in cases of severe jaundice.—*Revue Internationale de Bibliographie Médicale*, No. 8, 1891.

CHLOROFORM.

At the Therapeutic Section of the British Medical Association held at Bournemouth, Dr. Lewis E. Shore, gave an account of certain experiments made by Dr. Gaskell and himself on the action of chloroform on the respiratory centre, the vasomotor centre, and on the heart. In these experiments the application of chloroform directly to the exposed *fourth ventricle of the medulla* in the rabbit always caused a rapid cessation of respiration, by quickly diminishing the extent and depth of the breathing without markedly influencing the rate. This effect was sometimes preceded by evidence of excitation of both the respiratory centre and the vasomotor centre at the moment of application. One or two drops so applied were sufficient to kill the animal. With the failure of respiration the blood-pressure gradually fell, but was still considerable when the respiration stopped.

The injection of chloroform into the *internal carotid artery* of the rabbit caused a small long-maintained rise of blood-pressure, due to a stimulation of the vasomotor centre. The respiration became slower and changed in character, the inspiratory phase being markedly increased. Two or three minims of chloroform were usually sufficient to produce these changes. Further injection of one or two minims brought about rapid failure of the respiration, usually, indeed, a sudden cessation, notwithstanding a very high blood-pressure. Immediately the respiration stopped, the blood-pressure began to fall. That this was associated with the maintenance of the respiratory act, and not due to a depression of the vasomotor centre by the direct action of the chloroform, is shown by the fact that it did not occur if artificial respiration was maintained. Chloroform readily acted on the respiratory centre, first slightly

stimulating it, then paralyzing it. It stimulated the vasomotor centre, successive injection driving the blood-pressure higher and higher, but large doses ultimately paralyzed it. The respiratory centre always completely failed long before any depression of the vasomotor centre occurred. Injection of chloroform into the *vertebral artery* gave similar results, a smaller amount being needed; even half a minim sometimes sufficed to stop the respiration. With the cessation of respiration the blood-pressure at first fell, but that the vasomotor centre was not paralyzed was proved by the fact that a rise of blood-pressure occurred later on, due to the action on that centre of the asphyxial condition of the blood. In one case this asphyxial rise was as much as from 66 millimetres of mercury to 102 millimetres.

Injection of chloroform into the *jugular vein* produced very different effects. Its marked characteristic was a rapid fall of blood-pressure with weakening heart-beats; in one case, in a rabbit, 1 minim of chloroform injected into the jugular produced a fall of pressure from 104 mm. to 40 mm. in one minute, and another minim further reduced this to 26 mm. The respiration was at first not markedly changed, but after a few inspiratory gasps stopped rather suddenly one minute and fifteen seconds after the last injection; and although no pulse was evident in the carotid, the heart was found beating regularly but feebly three minutes later. The heart, although not absolutely arrested by the chloroform, was rendered inefficient to maintain an adequate circulation for the continuance of respiration. These experiments point to the conclusion that the fall of blood-pressure produced by chloroform is due to failure of the heart's action rather than to paralysis of the vasomotor centre. It may, however, be questioned whether the action of chloroform when injected into the vascular system is the same as when it is inhaled in the ordinary way.

In order to decide this question the following experiment was devised: Two animals were taken, two dogs or two rabbits, and the arteries supplying the brain of one animal were gradually ligatured so that its brain was completely prevented from receiving blood from its own heart. The arteries, carotids or vertebrals, and in some cases both carotids and one vertebral, were then connected to the corresponding arteries of the other animal, and the brain thus supplied with blood, which returned by one pair of jugular veins cross-connected in a similar way. Care was taken that the brain was at no time without a supply of blood, the last artery being ligatured at the same moment as the cross-circulation was established. Thus one animal, the *feeder*, was supplying its own brain by one carotid or one vertebral (and this always adequately sufficed), and also supplying the brain of the other animal, the *fed*. The blood-pressures of both animals were taken from the femoral arteries. When chloroform was given in the ordinary way, by inhalation, to the feeder, and the usual effects produced in that animal, namely, fall of blood-pressure and slowing of respiration, chloroform-carrying blood was also being sent to the brain, and the brain only, of the fed animal, and there produced insensibility, a rise of blood-pressure and slowing of respiration. When the fed animal, on the other hand, inhaled chloroform, a marked fall of blood-pressure was produced, and, as the chloroform could not reach the brain, this could only be due to a direct action of chloroform on the heart. In the latter case the chloroform could be pushed till the blood-pressure was nearly zero, and no heart-beats were visible on the tracing, and the animal would continue for some time to breathe regularly, the respiratory centre, of course deriving its blood-supply from the other animal, the feeder. If the brain of the fed animal, on the other hand, was richly supplied with chloroform, by giving large doses to the feeder, the respiration could be brought into a very precarious condition without the slightest fall of blood-pressure, the chloroform depressing the respiratory centre, but not the vasomotor. Complete stoppage of the respiration of the fed animal could not be produced before the feeder succumbed to the large quantity of chloroform given to it.

The experiments confirmed the results obtained by injection, and showed that the fall of blood-pressure observed in chloroform inhalation is due, primarily, to direct action on the heart, and not to a depression of the vasomotor centre.

A fall of blood-pressure was not, however, inevitable; complete insensibility may be produced without any fall at all, and usually the fall is slight, and a dangerous depression is only produced when the chloroform is given after insensibility is produced. The respiration begins to fail before the fall of pressure is dangerous.

These experiments were in accordance with those of the Hyderabad Commission, inasmuch as they show that, when chloroform is

administered without interfering with perfectly regular respiration, complete insensibility can be produced without obvious weakening of the heart's beat. Inefficiency of the heart is brought about by the rapid inhalation of chloroform in too concentrated a form. The experiments supported in two respects the practical teachings of the Hyderabad Commission, namely, that chloroform should be given gradually and with plenty of air, and that great care should be taken not to push the chloroform when struggling or gasping respiration occurs.—*British Medical Journal*, November 21, 1891.

STATISTICS CONCERNING ANÆSTHESIA.

GURLT (*Arch. f. Klin. Chir.*, Bd. 42, Heft 2, 1891) has collected a large number of statistics on the administration of anæsthetics, mostly from the practice of German surgeons, but including also cases from Austria, Switzerland, Russia, Sweden, Holland, and Belgium. The total number of administrations was 24,625, extending over a period of a little over six months. In 22,656 of these cases chloroform was used, with 6 deaths and 71 cases of threatened asphyxia; in 470 ether was the agent used, and among these cases there was no death and no accident; in 1055 cases a mixture of ether and chloroform was used, and there were five cases of asphyxia but no death; in 417 cases a mixture of ether, chloroform, and alcohol was employed, with 4 cases of asphyxia but no death; in 27 cases bromide of ethyl was used without any accident. These figures give a mortality for chloroform of 1 in 3776 cases, and a proportion of asphyxial accidents of 1 in 319. In the cases in which a mixture of agents was employed the proportion of asphyxial accidents was greater than when chloroform alone was used, being 1 in 211 for ether and chloroform, and 1 to 104 for ether, chloroform, and alcohol. The total number of these mixed administrations was, however, much smaller than those when chloroform alone was used. The apparatus employed is mentioned in only fifteen of the statistical reports. In these the one most employed was the Esmarch-Skinner mask; next in order of frequency came the apparatus of Junker, Kappeler, Kirchhoff, and Schimmelbusch. As regards the length of time the patient was under the anæsthetic, the administration lasted one hour and more in 20 of the 296 cases reported by Kraske, in 216 of the 353 cases reported by Billroth, in 34 of 924 cases by Mikulicz, and in 108 of 1159 by Trendelenburg. The longest time of administration among the whole number in any one case was 180 minutes (Trendelenburg). The quantity of chloroform used at each administration in the Charité Hospital during the last six years has averaged 1 cubic centimetre for each minute, or, in other words, 60 cubic centimetres per hour. The largest quantities used in any one administration were 150 cubic centimetres in a case of Thiersch's, and 180 in one of Von Esmarch's. The mixture of ether, chloroform, and alcohol used by Billroth and Von Hacker consists of 100 parts of chloroform, 30 of alcohol, and 30 of ether. In two of the cases in which bromide of ethyl was used recourse had ultimately to be had to chloroform, as anæsthesia could not be induced. The simultaneous injection of morphine during the administration of the anæsthetic is often mentioned in these statistics, some operators always employing it, others occasionally. With regard to the six cases of death under chloroform, post-mortem examination showed that in three of them there was fatty degeneration of the heart. The same affection probably existed in a fourth case; in the fifth the patient was very anæmic, and in the sixth nothing was found to account for the fatal result.—*British Medical Journal Supplement*, November 21, 1891.

INFLUENCE OF AGE ON THE ABSORPTION OF MEDICAMENTS.

GATSUBY has found that there is a very considerable influence exercised by age on the absorption of medicaments. Thus he found that when a dose of 2½ grains of potassium iodide was given to a boy of 8 years, weighing fifty-five pounds, the drug appeared in the urine in nineteen minutes, whereas, in a man aged 36 years, and weighing one hundred and fifty pounds, the iodine was eliminated in thirty-one minutes. The salicylate of sodium was eliminated in fifteen minutes in the child, but in the adult in from twenty to twenty-five minutes. An exception to these results was found in a man of 70 years who eliminated *the drugs three minutes before* a youth of 18 years.—*Revue Thérapeutique Médico-Chirurgicale*, November 1, 1891.

BROMIDE OF STRONTIUM.

SÉE has tried the bromide of strontium in certain affections of the stomach with good effect. He used as a minimum dose 30 grains and as a maximum dose 60 grains. The salt was found to be superior to sodium, and was employed in thirty-two cases of indigestion

which had hyperacidity or dilatation of the stomach with pain and marked flatulency. The digestion was complete for proteids but imperfect for the fats and starches. In all the cases there was rapid modification of the symptoms and in a number a complete cure. In eight cases of too little acidity the drug produced the same effects as in the cases of hyperacidity, but in one case no results were obtained. —*La France Médicale*, October 30, 1891.

ABORTIVE TREATMENT OF CORYZA.

For the aborting of an acute coryza in the early stages CAPITAN recommends the insufflation of the following powder into each nostril:

℞ Salol, gr. xv;
Acid. salicylic., gr. iii;
Acid. tannic., gr. ii;
Acid. boric. (pulv.), ʒi.

This treatment should not be continued for more than half a day, as the carbolic acid set free from the salol will injure the nose. After this powder is employed one composed of powdered talc and boric acid may be employed, or the following may be used in place of any of those given, and is equally satisfactory and more safe:

℞ Pulv. talc, gr. lxxv;
Antipyrin, gr. xv;
Acid. boric. (pulv.), gr. xxx;
Acid. salicylic., gr. iv.

A pinch of this may be frequently used without the disagreeable symptoms caused by the first prescription given.—*La Médecine Moderne*, November 12, 1891.

FRIGHT AND CHLOROFORM.

Under this title the *British Medical Journal* of November 7, 1891, reports the following case of death from chloroform. The facts elicited at the inquest held upon the remains of Mr. Weguelin-Smith showed that he suffered from varicose veins, for which he was to undergo an operation in St. Thomas's Home. Before this he was examined by the anæsthetist, who was struck by his "looking ill." However, the examination showed Mr. Weguelin-Smith, who was only 25 years of age, to be free from organic disease. He was, however, very nervous, and expressed a fear of chloroform. This anæsthetic was given, but when 20 or 30 drops had been administered, breathing and the heart's action stopped. All efforts to restore vitality failed. The chloroformist stated that his patient was at no time really under the influence of the anæsthetic, and that death resulted from syncope.

TURPENTINE FOR THE REMOVAL OF RENAL CALCULI AND GALL-STONES.

In the *Lancet* for December 5, 1891, RALFE contributes a paper on the subject of treating gall stones and renal calculi with turpentine. The turpentine should be given with the alteratives which are usually administered, with the hope of dissolving the stone or preventing its formation.

"The first experience I had of the value of turpentine occurred some years back, in the case of a gentleman who for nearly two years had been subjected to the 'solvent treatment,' and who, after several months of that treatment, began to pass small fragments of calculous matter, and to suffer greatly from frequent attacks of renal colic, as if the stone were making efforts to pass. At the same time there was much hæmaturia, and a considerable quantity of pus was discharged with the urine. For the relief of the hæmaturia and to diminish the pyelitis, turpentine was prescribed, with the effect that in a short time an oat-shaped calculus was expelled. This concretion was a mere shell of what had evidently been a solid calculus. I showed it at the Pathological Society (1882) as an evidence of what might be effected by the disintegrating action of soft water and by the chemical action of alkaline remedies. At the time, however, I paid little regard to the action of the turpentine in hastening the expulsion of the concretion."

After quoting several illustrative cases of the use of turpentine for renal calculi, Ralfe speaks of its employment for gall stone. "With regard to the action of turpentine on the expulsion of gall-stones my experience is not so considerable as with renal calculi, and it has rather been in the direction of prevention in cases where gall-stones were recurrent than in direct success as regards their expulsion. But this is of less importance since Trousseau speaks so favorably of it as an expulsive agent. In one case, that of a gentleman who was advised to consult me by Dr. John Williams, the patient brought a considerable number of calculi which he had passed during a period of three years at frequent intervals, and had only just recovered from the effects of passing the last. He was much jaundiced and emaciated, having lost more than a stone during the time of these recurrent attacks; and was exceedingly de-

pressed, being worn out by constant suffering and also by the dread of having to undergo an operation. He commenced taking turpentine, and from that time to this, now five years, he has never had colic or jaundice, or any reason to suppose that any calculus had passed. A second case was that of a clerk, who presented himself at the London Hospital suffering from attacks of recurrent jaundice attended with severe colic. He was ordered turpentine mixture, and shortly after commencing it he had another attack of colic, and then the attacks ceased. He presented himself for some weeks, during which the jaundice subsided, and he seemed completely recovered. He promised to come and see me or let me know should he again be troubled, but so far he has not applied. One other case, instructive as showing that turpentine has a directly expellant action, occurred in a patient in Davis ward at the London Hospital. She had suffered for a long time past with a pain in the right hypochondrium, which came and went. It was colicky in its nature, usually made her very sick, but was not attended with jaundice. Thinking it might be due to gall-stones, I prescribed turpentine. The pains were increased, and in a day or so she became jaundiced. No stone, however, passed, as it was probably too large for passage, and after giving the turpentine a fair trial the attempt was abandoned and an operation advised. Still, in this case efforts at expulsion distinctly followed each time the administration of turpentine was renewed.

"Since this was written another case in which the administration of turpentine was followed by the immediate expulsion of several small gall-stones has come under my observation. This gentleman had suffered from pain and sickness for three years. The administration of turpentine at once brought away a small concretion, which has since been followed by others, with relief to his other symptoms.

"In conclusion, it may be as well to consider how turpentine acts in thus causing the expulsion and the prevention of calculi. First as regards expulsion. It has been stated that turpentine acts powerfully as a diuretic, and thus helps in washing down the stone. This may be so when turpentine is given in small doses for some time, and may thus help to wash down a small recently-formed concretion; but when there is much colic, and there is a decided tendency for the stone to pass, I have noticed that, so far from turpentine acting as a diuretic, it has an opposite tendency; indeed, on these occasions one has to be very guarded as to giving the drug, as strangury is then so easily induced. On the other hand, turpentine decidedly increases the colic, and it would appear as if it actively stimulated the muscular fibres of the pelvis of the kidneys and ureters, and also of the gall-bladder and bile-ducts. This, I think, was shown in a case I saw with Dr. Mare, of Grays, in which, combined with frequent colic, there was considerable hæmaturia and pyelitis; after a time these symptoms yielded to treatment, but Dr. Mare informed me that whenever the temperature was resumed the colicky pain returned, though at other times the patient was free from pain. In long-standing cases turpentine aids the passage of a calculus by improving the condition of the mucous surface of the ureters and bile-ducts; for by diminishing the swelling caused by catarrh there is less resistance presented to the onward passage of the concretion, and especially allowing it to pass while still small. In those cases also in which there is a tendency towards the constant formation of calculous concretions, as shown by a more or less frequent recurrence, turpentine acts as a preventive by rendering the secretion less tenacious and viscid,—that colloid medium, which all writers who have described the formation and growth of calculous concretions insist on as essential for their development. Finally, with respect to some forms of gall-stone, not only does turpentine aid in preventing their formation by its action on the mucous surface of the gall-bladder and rendering the contents less viscid, but also probably exercises an antiseptic action on the bile secreted, and thus prevents the precipitation of cholesterin, which, we know, becomes less soluble as bile loses its natural alkaline reaction, which it does if any fermentative changes take place in it."

THERAPEUTICS OF DIPHTHERIA.

Professor Strübing, of the University of Greifswold, discusses the therapeutics of diphtheria in the *Deutsche Med. Wochenschrift*, November 26, 1891. He believes that the exudative process in the throat may be due to a streptococcus, in which case the disease is pseudo-diphtheria, or to the bacillus of Löffler, in which case the disease is true diphtheria. He admits that in the early stages it is impossible to tell one from the other, except through bacteriological examination.

As Löffler stated in his first work, three things are demanded, — first, to influence the vitality of the bacilli and to check their further growth; by this means the further production of material injurious to the or-

ganism would be hindered; second, to destroy the effect of the poison which has already entered the organism; and, finally, to check the invasion of other organisms, and, in case this has already occurred, to remove their effect.

For local treatment, Strübing has employed alternately an alcoholic iodine-carbolic acid solution,—*liquor ferri sesquichloridi* and sulphur. The throat is to be carefully cleansed with abundant gargles, diluted lime-water generally having the preference when the nasal passages are affected; these should be cleansed also. Inhalations take the place of gargling, especially in small children. Internally, Strübing gives hourly a teaspoonful of a solution of the cyanide of mercury of a strength of one-sixth of a grain to three fluidounces. Strübing has tested in practice the results of Löffler's bacteriological investigations. As the most certain measure he always employs a combination of oil of turpentine (f℥xss), carbolic acid (♏xlv to ♏lxxv), and absolute alcohol (f℥ii). This was applied to the diseased surfaces upon absorbent cotton every four, six, or eight hours. Besides, in suitable cases, a mixture of carbolic acid (gr. xlv), alcohol (f℥i), distilled water (f℥ii to ℥ii), was used as a gargle. Adults were directed to use a teaspoonful, and children a small teaspoonful, as a gargle, every four to eight hours, and to hold it in the throat, if possible, for ten or fifteen seconds. Both solutions are disagreeable, especially on account of the alcohol. Adults are more likely to object to them than children. The dangers of carbolic acid poisoning can be guarded against by watching the urine. Without waiting for the appearance of the olive-green color of the urine, it is time to lessen the frequency of the carbolic acid gargling when the urine gives an intense reaction with *liquor ferri sesquichloridi;* a slight reaction demands no consideration. The slightest toxic albuminuria would naturally cause the suspension of the treatment. In order still more to meet the dangers of poisoning, the patients should take internally, at the same time that they are using the carbolic acid, small doses of sulphate of sodium, in doses to be determined by the effect of the salt upon the bowel. Gargles of carbolic acid were not employed until it had been proved by trial with salt-water or lime-water that the patient was able to gargle well, and so avoid the danger of swallowing the fluid. There is room for the utmost care in this respect, especially in the case of children.

As an additional cleansing measure for the mouth and throat, gargles of lime-water, etc., were employed in the intervals. In seven cases the patients received cyanide of mercury internally.

In other patients the local treatment with mercury was carried out. The diseased spots were rubbed with a solution of corrosive sublimate, 1 to 1000, every four, six, or eight hours. As a gargle, a solution of corrosive sublimate, 1 to 10,000, or a like strength of cyanide of mercury, was used.

As the urine cannot be depended upon to indicate when poisoning is likely to occur under the use of corrosive sublimate, efforts have been made to determine what is a safe quantity to employ as a gargle. Strübing thinks that a safe limit is found in 100 cubic centimetres a day of a 1 to 10,000 solution for adults, and 50 cubic centimetres (1¾ ounces) for children. All gargling is to be stopped if it be found that the patient is likely to swallow part of the solution.

The mercury treatment seems in true diphtheria to have certain advantages over other methods. Rapid results are obtained in the beginning of the disease in many cases.

Severe cases with extensive local development of the diphtheritic process offer slight chances for recovery. In cases in which the process extends slowly, even if it be possible to check further extension, the secondary changes in the organism, especially in the heart, often cause death. Our powers are, unfortunately, still limited when the disease extends to the larynx. In favorable cases tracheotomy relieves the stenosis of the larynx, and through frequent or constant inhalation of lime water, papayotin, lactic acid, etc., we can favor the solution and removal of the membrane. Inhalations of carbolic acid may directly influence the process.

Scarlet fever diphtheria has been found by Löffler to be due to streptococci. The carbolic acid treatment is the most successful.

A NEW METHOD OF BLOOD TRANSFUSION.

Dr. A. Hertig, of London, gives an excellent historical review of the methods that have been employed hitherto for the transfusion of the blood, and refers to the discovery of Arthus and Pages, that it is possible to keep the blood fluid if its lime salts are precipitated in the form of insoluble oxalates. This discovery, he says, in the *Wiener Medicinische Blätter*, December 10, 1891, has been put to a practical test by Dr. A. E. Wright in the

laboratory of the Royal College of Physicians in London. Wright has bled dogs, deprived the blood of its lime salts, and then transfused it into the jugular veins of the animals. The blood, when thus deprived of its lime salts, it should be stated, appears to be normal, as far as we can see, except that it has no lime which can give rise to the formation of fibrin, and that it has suffered a slight dilution, about a tenth of its volume. The animals subjected to the experiment showed no pathological symptoms, the blood presenting a normal microscopic appearance. In one case, after a second transfusion, a rise of temperature of four-tenths of a degree Fahrenheit occurred.

In the case of men, it is recommended that the blood should be taken directly from the vein of the person supplying it in small portions and kept separately. Then, so long as the quantity of the soluble oxalates necessary for the precipitation of the calcium salts is not known, small quantities of blood are to be tested with a one, one and a half, and two per cent. solution of sodium oxalate. When the necessary quantity of oxalates is accurately determined, the operation proper is proceeded with, in which care must be exercised that the oxalate solution and the blood is intimately mixed, and that the small portions of blood received should be kept in separate vessels at the temperature of the body for ten minutes before beginning the injection. By having small portions in separate vessels, if a coagulum forms in one vessel, the others may be used for transfusion.

In how far the oxalates, especially when in some excess, can act injuriously upon the organism, and what disagreeable accompanying effects the transfusion of blood, deprived of lime, may have, can only be determined by a large series of experiments.

TREATMENT OF SYMPATHETIC OPHTHALMIA.

M. Secondi (*Annali di Ottalmologia*, anno xx., fasc. 3), believing in the existence of migratory ophthalmia in the true sense of the word, bases his treatment upon this belief. In a patient who already showed posterior synechiæ and deposits on the capsule of the lens, of sympathetic origin, the left eye was subjected to three injections of a gramme each of a solution of sublimate (sublimate, 1 : 1000; chloride of sodium, 5 per cent,). This treatment caused the synechiæ and deposits to disappear. The visual acuity, which previously had been equal to counting fingers at six feet, rose to two-thirds of normal. It is interesting to note that the treatment of the injections was preceded by the taking out of the exciting eye.—*Annales d'Oculistique*, November, 1891.

PERITOMY IN PHLYCTENULAR PANNUS.

Verrey (*Revue Médicale de la Suisse Romande*, November 20, 1891) advocates peritomy as a radical treatment in relapsing phlyctenular affections. For several years he has performed this operation in children in whom phlyctenular keratitis had lasted for years, and had increased to a considerable extent. There may be only an eruption of a few fresh phlyctenules, or more or less opacity of the cornea, and the development of vessels which proceed from the periphery and penetrate into the cornea. On the other hand, there may be ulcers or purulent infiltration, often central, and numerous vessels proceed from all points of the circumference of the cornea towards the lesion. Usually the patients under these circumstances have been discouraged by numerous relapses, and are willing to submit to an operation. This is done as follows:

Either chloroform is given, or else the eye is anæsthetized with a strong solution of cocaine. An ophthalmostat is adjusted; the conjunctiva is seized with forceps two or three millimetres from the corneal limbus; the point of a pair of scissors is inserted as near as possible to the edge, the membrane being severed close to the cornea, and one-half to two-thirds of the whole of the circumference of the conjunctival insertion is severed. If the conjunctiva has not been severed close to the cornea, the few remaining shreds are carefully taken away. This removes the thickened tissue which is so apt to exist in this place. If necessary, this thickened tissue is scraped with a cataract knife. The attachment of the conjunctiva to the capsule of Tenon is then severed, and this may be sufficient, but in most cases it is necessary to seize the edge of the attached conjunctiva and resect a circular fragment of about three or four millimetres in breadth. The conjunctiva is then separated from its insertion in the cornea by a space of exposed sclerotic about seven millimetres in breadth. The operation is completed by scarification of the episcleral bed and the sclerotic itself, after

cutting as many vessels as possible. Cold compresses applied to the eye arrest the hemorrhage, and finely-powdered iodoform is dusted over the surface, and a compressing bandage is applied. The bandage must be removed at least twice a day, on account of the secretion. At the end of several hours the pain has ceased, and, after the first dressing has been changed, Verrey declares that photophobia no longer exists.

At the end of several days a whitish deposit forms on the wound, followed by small granulations, which gradually cover the bared surface, and sometimes are so exuberant that they must be cauterized with nitrate of silver. After this treatment, the infiltrations of the cornea are said to absorb rapidly. At the end of two weeks the bandage is removed and the application of yellow oxide of mercury salve is begun. Four weeks after the operation, the cicatrix, at first reddish, is flattened, becomes pale, and ends by forming a pericorneal circle of two millimetres in size and pale in contrast with the rest of the bulbar conjunctiva which is still injected.

Verrey is not in favor of performing peritomy with the galvano-cautery, and thinks that the chief advantage of his operation is the circular contraction, which he succeeds in getting by separating the membrane from the capsule of Tenon. In one case, in which he performed peritomy in parenchymatous keratitis, he thought the disease was favorably modified by the treatment, but is unwilling to draw conclusions from an isolated case. In partial peritomy, performed in a case of sclero-kerato-iritis, the operation was absolutely without result.

MANAGEMENT OF THE CAPSULE IN CATARACT EXTRACTION.

Dr. Eugene Smith (*Journal of the American Medical Association*, December 5, 1891) predicts that the day is not far distant when the simple flap extraction will be accepted by all ophthalmic surgeons, and iridectomy performed only in those exceptional cases in which the indications for it are very strong.

According to Dr. Smith, the best method of dealing with the capsule is by extraction of its anterior face. One of the difficulties is the imperfection of the forceps which have been hitherto in use. Dr. Smith briefly refers to the forceps of De Wecker and those used by Knapp, and then describes one of his own device, modified from Knapp's. His modification consists in having three teeth and four teeth only, and having only the points of the teeth sharp, that they may sink into and tear, not cut. The principal modification, however, is the curving or dropping downward of that portion of the ends of the blade which contains the teeth, below the plane of the blades, that the teeth may set down in the pupillary space without tilting the forceps.

The blades of the forceps are closed and introduced as is done in iridectomy; the end of the forceps is then pulled forward until the curved portion, containing the teeth, is in the pupillary space, when the blades may be allowed to open to their full extent beneath the pupillary border, and by gentle pressure against the lens the capsule is seized and extracted.

TREATMENT OF VESICULAR KERATITIS.

Wecker and Landolt (*L'Union Médicale*, No. 147, 1891) think that it is not sufficient in vesicular keratitis, or herpes of the cornea, to evacuate the contents of the vesicles by puncture, inasmuch as the liquid is soon reproduced. The parietes of the vesicles should be removed with forceps, or the lesion should be well-scraped with a cataract-knife, and the eye covered with a compress. If the patient will not submit to this operation, they recommend introducing into the eye a pinch of calomel or other powder capable of destroying the thin walls of the vesicles by friction. In addition, instillations of eserine or of pilocarpine are useful.

TREATMENT OF TRACHOMA.

Dr. F. B. Tiffany (*Kansas City Medical Index*, December, 1891) reports his satisfaction with the improved trachoma-forceps devised by Dr. Knapp, the essential principle of which is its stirrup-shape, and its foot, consisting of a corrugated, rotating cylinder. Dr. Tiffany has used the treatment since September of last year, and has operated on twenty-three cases. Three of these had been persistent, and are now cured. He considers the advantages of the treatment to be the absence of tearing of the tissues, the absence of subsequent cicatrices and disfigurement from discolorations, and that the cure is brought about in less time than by other known treatments.

TREATMENT OF TRACHOMA.

M. ELIASBERG (*Gaz. Méd. d'Orient*, September 15, 1891) extols massage with boric acid powder in ordinary cases. When there is pannus, or the conjunctiva tends to cicatricial contraction, he advises the alternate use of creolin (1 : 100) and of sublimate (1 : 400) in instillations.—*Annales d'Oculistique*, November, 1891.

SEROUS IRITIS.

M. CHATELOT (*Thèse de Paris*, 1891, abstract, *Annales d'Oculistique*, November, 1891) does not consider this disease connected with any one determined cause. He refers to the fact that it often depends upon a septic infection produced by metastasis, or by deviation in the course of certain diseases, or general conditions,—*e.g.*, variola, syphilis, scrofula, etc. It is seen in connection with menstrual disturbances, and rarely with rheumatism. The *therapeutic point* of the utmost importance is that atropine, ordinarily a remedy of paramount importance in iritis, should be used with considerable caution in so-called serous iritis, lest it produce glaucomatous phenomena, which are always likely to be present in incipiency.

SUBCONJUNCTIVAL INJECTIONS OF SUBLIMATE SOLUTION IN THE TREATMENT OF INFECTIOUS CORNEAL DISEASES.

M. SECONDI (*Annali di Ottalmologia*, anno XX., fasc. 3) reports some very surprising results in the treatment of ulcers of the cornea by this method. He uses the three following solutions, 1 : 200, 1 : 1000, 1 : 2000, and injects about one-third of a Pravaz syringeful beneath the conjunctiva, in the neighborhood of the diseased part of the cornea. The author states that he has also obtained equally good results in choroiditis and iritis.—*Annales d'Oculistique*, November, 1891.

THE TREATMENT OF INFLAMMATIONS OF THE CORNEA.

KROLL (*Berliner Klin. Wochenschr.*, No. 48, November 23, 1891) dwells at some length on the various inflammatory affections of the cornea, in order to show that it is unnecessary to use atropine very extensively, and, indeed, that all remedies should be exceedingly mild. He refers to the work of Samelsohn concerning the inappropriate use of atropine, and agrees with him that its application is limited, basing such an agreement upon the physiological action of the drug, believing that the older ideas of its action in keratitis are unproven.

He thinks that it is suited to types of keratitis only when these are associated with involvement of the iris. If the appearance of the pupil is not altered with oblique illumination, if the pupil is not abnormally narrow, if there is no very evident deep, pericorneal injection, if the iris-vessels are not abnormally distended, the iris is certainly free from disease, and atropine is superfluous. For example, Kroll believes that in all uncomplicated corneal wounds, as an infection of the wound is specially to be guarded against, both atropine and the compressing bandage are contraindicated, because the latter cannot be applied in an antiseptic manner, owing to the connection between the nares and the conjunctival cul-de-sac.

This leads him to speak of the use of boric acid, of which he is a most earnest advocate, giving to it antiseptic properties greater than those which it is ordinarily supposed to possess. He thinks, moreover, that the boracic acid penetrates into the epithelial layers and tissue of the cornea.

He has made a number of experiments to show that penetration of substances into the cornea is possible, using, for, instance, a bichloride solution of 1 to 1000, which has been colored brown. Rabbits were taken, the cornea scratched with a needle, and the fluid dropped into the cul-de-sac. Fifteen minutes later the cornea was removed and the preparation examined, and it was found that the sublimate solution had penetrated into the substance of the cornea. Kroll argues that this must be even more the case with boric acid, because it does not coagulate albumin and does not make a combination with it, as is the case with the sublimate solution.

On these grounds he treats inflammations of the cornea in some patients with a four per cent. solution of boric acid, and in others with a sublimate solution 1 to 10,000. If there is any lack of improvement, in the place of the boric acid collyrium he uses lukewarm applications to the closed lids, usually with sublimate solution of 0.2 to 300, with a like quantity of warm water three times a day for ten minutes at a time. In addition to this,

iodoform salve is employed, 1 part to 2 of vaseline, a certain quantity being introduced after each bichloride bath, and retained there by means of a bandage. Atropine is employed only if there is iritis. In doubtful cases a drop of the atropine solution is instilled in order to watch its effect upon the iris.

In children, he does not employ the boric acid instillations, presumably because they are not so conveniently made. He uses the lukewarm antiseptic douches, and, in place of atropine, employs cocaine, if there is a high grade of photophobia. [The frequent use of cocaine in corneal ulceration is a reprehensible practice.—ED.] In ulcerative processes iodoform salve is employed. After the irritation-symptoms are gone, he uses a two per cent. solution of yellow oxide of mercury.

In closing, Kroll remarks that for six years he has employed boric acid irrigations in infiltrations of the cornea, small abscesses and superficial ulcers, and in phlyctenular keratitis of adults, and thinks that atropine was necessary in few cases.

PYOKTANIN IN BLENNORRHŒA OF THE CONJUNCTIVA.

In a paper read before the Mississippi Valley Medical Association, and published in abstract in the *Journal of the American Medical Association*, December 5, 1891, DR. JAMES J. T. JELKS, after a brief review of our bacteriological knowledge concerning purulent conjunctivitis, speaks of the use of pyoktanin in this affection. Inasmuch as he believes that pyoktanin penetrates the epithelial covering and proceeds to the papillary layer of the conjunctiva, he was led to its use in purulent affections of this membrane. His results are summarized in the following words: "Some of the cases have gotten well with marvellous rapidity,—a few in twenty-four to forty-eight hours. Again, others have gained no benefit from the remedy. I am not able to tell why this should be." Dr. Jelks has been accustomed to use a saturated solution of pyoktanin (which variety is not stated), endeavoring to retain the fluid for five or ten minutes in contact with the affected area. He also refers to the method which has been advocated by Dr. G. W. Broome, of using pyoktanin, in the form of a dry power, in the treatment of blennorrhœa.

EYE-DRAIN AND IRRIGATOR FOR USE IN PURULENT CONJUNCTIVITIS.

DR. E. L. OATMAN considers the greatest obstacle to the satisfactory treatment of acute, destructive conjunctivitis the imperfect means which are employed in cleansing the eyes. In order that the eyes in cases of this character may be freely irrigated, without at the same time wetting the patients and the bedding, he employs drains, which are described, with an illustration, in the *Medical Record* for December 19, 1891:

"The frame of flexible copper is covered with gutta-percha; this passes across the forehead, and encircles the eyes as far as the nose. To the sides are attached soft rubber cups, which collect the waste fluid and discharge it through tubes into a basin on the floor. The flexible copper permits the apparatus to be accurately moulded to the form of the face, and its successful operation will depend on the care with which this is done. An adjustable steel spring, fitting over the frame, presses it firmly against the cheeks. The spring is made separately, and only applied during the cleansing process, as its long-continued pressure might prove painful; although, if intelligently adjusted, with only sufficient force to prevent leakage, it may be worn continuously for hours and days. When it is desirable to keep a gentle stream of water, hot or cold, flowing constantly over the lids, and the patient cannot command the undivided attention of a nurse, an irrigator is used, in which the fluid is delivered through a rubber tube, wound outside with stout soft copper wire. Such a tube when bent will retain its position, and we are thus enabled to discharge the stream in any direction or at any angle. An iron frame attached to the head of the bed supports the tube and a reservoir."

FATAL HEMORRHAGE AFTER SCARIFICATION OF THE CONJUNCTIVA.

DR. I. A. SHIRLEY, of Winchester, Ky. (*New York Medical Journal*, January 2, 1892), reports the case of a mulatto baby, 6 weeks old, who bled to death after scarification of the conjunctiva, which was done to relieve a muco-purulent conjunctivitis associated with much swelling of the lids and hypertrophy of the conjunctiva.

Immediately after the scarification the bleeding was free, and some time afterwards blood came in a continuous, steady stream. Sponges wrung out in hot water

were used, and iced compresses were tried. Persulphate of iron in powder and in solution was also given a trial, but all local applications failed to stop the bleeding, which was noticed to come from the transverse incisions near the superior palpebral fold. Finally, the hemorrhage was controlled by means of deeply-placed sutures. Ergot and stimulants were given, but the child died in two hours.

The interest of the case attaches to the loss of life following a very ordinary surgical procedure, and the reporter necessarily thinks of the possibility of hæmophilic tendency, but does not seem to have established this history. He considers his case a warning, in so far as indiscriminate scarification of the conjunctiva is concerned.

ANTISEPSIS IN OCULAR SURGERY.

M. Bourgeois (Reims, 1891, Matot-Braine, abstract, *Annales d'Oculistique*, November, 1891) has constructed an apparatus to sterilize instruments by boiling, distinguished especially by its great simplicity. It is composed essentially of glass tubes, in the form of ordinary test-tubes, which may be placed over an alcohol lamp. He uses neutral glycerin as the boiling liquid, and stops the operation the moment steam begins to appear. The temperature is then from 120° to 130° C. Immediately afterwards the instruments are passed through alcohol, which instantly dissolves the glycerin.

CONSERVATIVE SURGERY OF THE EYE.

This was the title of a paper read before the Canadian Medical Association in September, 1891, by Dr. F. Buller, and is published in the *Montreal Medical Journal* for December, 1891.

Dr. Buller believes that children and young people are more liable to sympathetic ophthalmia than adults. Therefore many surgeons have advised the removal of injured eyes in children whenever there was any risk at all of sympathetic ophthalmia. This view Dr. Buller no longer maintains, but thinks that the eye of a child should never be enucleated on account of an injury, unless sympathetic ophthalmia has actually occurred. He looks upon the disfigurement which intensifies with years as a barrier to the operation, and makes a plea for conservative surgery in these cases.

According to Buller, all the serious injuries of the eye may be divided into those which are likely to be followed by great damage to vision or its total loss, and those in which vision is obviously destroyed.

In the first instance, he thinks the surgeon should spare no pains to save as much vision as possible, and on no account should sacrifice the eyeball if there is any reasonable chance of saving the other eye from sympathetic irritation.

In the second class of cases, the hopelessly blind eye may be immediately removed, or so much of it may be preserved as will form a good movable stump for an artificial eye. Even in wounds in the dangerous region he advises conservative surgery and careful watching of the case; while if the patient is brought when chronic iridocyclitis has appeared, he favors resection of the optic nerve, if the condition of the injured eye is such as to indicate grave danger of sympathetic ophthalmia, and particularly if at the same time the eye bids fair to retain a presentable appearance.

In the second class of severe injuries, vision being hopelessly lost, he resorts to immediate evisceration, as follows: The cornea is first cut away and enough of the sclerotic on either side to make a lozenge-shaped aperture. This will admit of the insertion of an artificial vitreous. After wiping out all of the contents of the sclera, and waiting until bleeding has entirely ceased, the glass globe is inserted, and the transverse wound in the sclerotic united with four black silk sutures. A conjunctival suture is also placed at either angle. Finally, the conjunctiva is thoroughly washed with sublimate solution, dusted with finely-powdered iodoform, and an absorbent cotton pad saturated with sublimate solution applied by means of a compressing bandage. Considerable reaction may be expected, with some pain for a few days. To relieve this he gives 10 grains of phenacetin at night to an adult, or morphine if the pain is severe. At the end of forty-eight hours the bandage may be removed, and in a favorable case the conjunctival wound will be found to be united. If there is much swelling, iced compresses soaked in a weak sublimate solution should be used.

The important points in the operation, according to Dr. Buller, are perfect antisepsis; proper removal of the cornea, so that a lozenge-shaped aperture remains; complete arrest of the hemorrhage before the insertion of the glass globe; and the use of a globe, which should lie quite loosely in the scleral cavity.

TREATMENT OF ABSCESS OF THE FRONTAL SINUS.

In the *New York Medical Journal* for Saturday, December 19, 1891, Dr. Charles Stedman Bull discusses tumors of the orbit secondary or consecutive to tumors of the neighboring bony cavities. The following operation is performed by this surgeon as soon as he has positively made a diagnosis of abscess of the frontal sinus.

The incision should be made, starting from near the inner canthus, immediately beneath the superior orbital arch, directly outward, and from an inch and a half to two inches long, so that if the bony wall of the sinus, which is here very thin, has not already been perforated, it may be easily opened. The pus then flows out, and the sinus should be thoroughly washed out with a solution of mercuric bichloride (1 to 1000). The opening should be large enough to admit the little finger, and the cavity of the sinus should be carefully examined for fungoid granulations or osteophytes, and these, if found, should be thoroughly removed. Then the septum between the sinuses should be examined for a perforation, for, in some cases, this partition-wall has been found not only perforated, but nearly entirely absorbed. A drainage-tube should then be inserted, and the cavity carefully washed out twice daily. The re-establishment of the channel of communication between the sinus and the nasal fossa is sometimes advisable. This may be done by opening into the ethmoid cells by chisel or mallet, or by trephine, or by introducing a catheter through the fronto-ethmoidal canal and then a drainage-tube through the nose, after the plan advocated by Panas. After the opening of the sinus along the orbital margin, the first thing necessary is a thorough irrigation of the sinus. After the pus ceases to be discharged through the drainage-tube, the cavity generally begins to granulate from the bottom, and in from three to four months the cavity has usually entirely healed.

THE TREATMENT OF SENILE GANGRENE OF THE LOWER EXTREMITY, ESPECIALLY AS OBSERVED IN DIABETICS.

Heidenhain (*Deutsche Medicinische Wochenschrift*, 36 and 37, 1891) contributes a valuable paper upon the treatment of senile gangrene, especially when observed in diabetics. He bases his work on a general study of the literature of the subject, and particularly upon twenty-five cases occurring in the practice of Küster. Upon these twenty-five cases thirty primary and ten secondary amputations were performed. In eleven cases of diabetic gangrene six were saved by high amputation. In all cases where there was much sugar, from five to eight per cent., or where there was much albumin together with sugar, death resulted. Among the fatal cases were two double amputations. Of the fourteen cases operated upon on account of senile gangrene, nine recovered. Of six who died, two perished from gangrene of the flaps and sepsis, two from heart-failure or hypostatic pneumonia, and two from myocarditis and nephritis. As a result of his study of the subject, Heidenhain comes to the following conclusions:

1. The alteration of the tissues occasioned by diabetes, and possibly the increased amount of sugar contained in the juices of the body, render even a very slight wound infection exceedingly dangerous, inflammation having a marked tendency to go on to sloughing and gangrene. This is further instanced by the frequency with which phlegmonous, carbuncular, and gangrenous processes are noticed in diabetics.

2. Diabetes seems to be frequently associated with arterio-sclerosis. This is noted particularly in young people.

3. Diabetic gangrene is due in the great majority of cases to precisely the same cause as is commonly operative in senile gangrene, namely arterio-sclerosis.

4. Senile gangrene is due either primarily to an inflammatory lesion of the blood-vessels, or more frequently to a thrombotic closure of the principal arteries of the extremity.

5. As long as only one or two toes are affected by the gangrene it is safe to wait for the line of demarcation, the surgeon confining himself to local antiseptic treatment and to placing the foot in an elevated position. When the gangrene extends to the back or sole of the foot, amputation of the thigh should be performed, the flaps being made as short as possible. Extension of the gangrene forms the indication for amputation of the thigh. In the cases tabulated by the reporter amputations below the knee were followed by gangrene of the flaps almost without exception, so that a secondary and higher amputation was necessitated.

In this country most surgeons hesitate to operate under the conditions described by Heidenhain. His excellent results incident to high operation should dispel this fear.

IMPLANTATION OF LARGE FRAGMENTS OF DECALCIFIED BONE.

LE DENTU (*La France Médicale*, 38 An., No. 48) operated upon a young man who suffered for many years with tubercular osteitis of the tibia. He resected about three inches of both tibia and fibula, and extirpated a considerable portion of the upper surface of the bones, together with a portion of the astragalus, this bone being involved in the disease. He replaced the resected bones by a single fragment of decalcified calf bone, three inches in length. Periosteum and the soft tissues were carefully sutured over this implantation, and the dressing was completed by a plaster-of-Paris bandage, which immobilized the foot and leg. On the fifteenth day the dressing was removed, and a large quantity of serum escaped. Six weeks after operation there was very evident consolidation, and the patient was able to walk, the limb being supported by a silicate bandage. Between the lower extremity of the new bone and the upper surface of the astragalus a movable articulation was established. Ultimately there was complete recovery, and the patient was able to walk several miles without fatigue, his foot being supported by thin boards, which gave lateral support. The author operated in a similar manner on nine other patients.

The bone is prepared in the following manner: It is taken from an animal recently killed, and is at once stripped of its periosteum and its marrow. The femur and tibia of the ox form the best material. The fragments are cut the proper dimensions, and are immersed in a solution of hydrochloric acid, one in ten, for eight days. A longer soaking renders them too soft. After the hydrochloric bath they are washed in pure water, left in a sublimate solution for twenty-four hours, and then stored in iodoform and ether. The especial advantage of this method is that the long fragment of bone is able to act the part of a temporary support, which before its absorption allows time enough for the formation of new bone. Conditions most favorable for success are that the subjects should be young, that the diseased parts should be completely ablated; and that there should be left either a periosteal layer or a thin sheath of bone. This method of treatment is particularly applicable in complete resection of the small bones, such as is frequently necessitated by tuberculous osteitis; in resection in the continuity of long bones, such as is required in complicated fractures or tumors; in trephining of the skull, and in the curative treatment of pseudarthrosis.

THE SURGERY OF THE TONGUE.

JONATHAN HUTCHINSON (*British Medical Journal*, No. 1614, 1891), in an address upon the surgery of the tongue, dates the beginning of progress in successful operative procedure upon this organ from the introduction of the écraseur. He states that experience has proven that it is by no means necessary to excise the whole of the organ in cases where the disease is limited to one part. Recurrence is far more liable to be observed in more or less distant lymphatic glands than at the seat of operation. The real risk in these operations is that of gland infection, and this begins almost from the very day that the sore assumes suspicious features. The cases in which it is necessary to remove absolutely the whole of the organ are but few, and will become less frequent as early diagnosis is better understood. In the whole of the author's experience of surgery of the tongue there were but four cases in which the disease returned in the organ itself, or, indeed, in the mouth. One of these was a case of very advanced disease, in which the whole tongue was removed; the tissues were infected so far back that the cancer appeared again before the wound was well healed.

In at least three-fourths of the cases the disease recurred in the glands; in many the intervals were very considerable. Experience, however, compels the admission that, however early the stage at which the operation for cancer of the tongue is performed, the probability is very great that enlargement of the lymphatic glands will sooner or later follow. In very few of the cases in which the glands become enlarged are conditions favorable for operation with an ultimate successful result. It is a rare exception after removal of involved glands for the patient to enjoy any long-continued immunity.

The commonest region for involvement of lymphatic glands is in the floor of the mouth. Early operation in this region offers some chance of success. In one case of this nature, operated upon by Sir Joseph Lister, the patient survived nine years after the removal of the cancerous tongue, eight years after the extirpation of the glandular tumors. Another position in which isolated glands at times enlarge is at the anterior edge of the sterno-mastoid at its upper third. The gland is often single, and, provided it has not acquired adhesions, its removal may be easy and attended by good results. The worst position in which the recurrence of gland-disease can take place is

in the back of the neck behind the mastoid process and the upper part of the sterno-mastoid. The glands grow rapidly here, produce much pain, and cause the patient's death in a short time. If the gland tumors appear in one of these three regions, the other two will probably be free. This fact gives support to the belief that lymphatic involvement is due to migration of infective elements in very small numbers, and is acquired through location in one or the other part almost as a matter of accident.

The author has never on a large scale tried any other operation than that by the écraseur. Cutting through the tongue should occupy half an hour by the watch. The galvano-cautery was tried for a year, but was given up on account of the tendency to secondary hemorrhage. The instrument used is armed with a loop of well-tempered wire; the mouth is kept open by a gag; the tongue is seized near its tip with the vulsellum, and dragged forcibly forward. It is then transfixed well behind the diseased area by two strong steel hooks; the vulsellum is then removed; the wire loop is passed first over the handles of the steel hooks; then over their points, the nozzle of the instrument being pushed well into the mouth, and care being taken that the wire bites at the proper place; the screw is used rapidly until the wire is well buried in a deep groove. After this the steps are very deliberate. After the wire has cut through, the lingual arteries will bleed freely when the surface of the wound is rubbed. They should be encouraged to bleed, so that they can be secured by ligature. During the use of the instrument the operation is bloodless.

The patient is given liquid diet through a long flexible nozzle, pushed well back into the throat. On the day after operation he is encouraged to leave his bed, since the sitting posture admits of easier washing of the mouth; this is done very frequently, a teaspoonful of spirits of wine being used in a tumblerful of water. At the end of a week or ten days the patient is sent into the fresh air. In one case it was necessary to divide the jaw. In several, where the disease lay far back, the cheek was cut through. In several cases removal of the entire organ was necessary, and where it was not easy to drag it out of the mouth the mucous membrane was divided by means of the scissors, and the tongue was further severed by forcibly pushing the finger under it.

Since the patients who suffer from cancer of the tongue are often old and debilitated, and hence stand even moderate loss of blood badly, and since bleeding into the mouth in one who is under an anæsthetic is always attended by the danger of secondary pneumonia, and since the écraseur-wounds heal well and do not occasion septic poisoning, this instrument should for general use take precedence of all others in excisions of the tongue.

The author states that he has lost but one patient from this operation. This patient was treated in the hospital. His cheek was divided. Erysipelas attacked this wound and he perished, probably from extension of the inflammation to the stump of the tongue. Nearly all the patients operated upon were men, and these were nearly always smokers, who had in early life suffered from syphilis. Hutchinson believes that the term "precancerous stage" is justifiable, and that there is a period when the naked eye diagnosis is possible before anything is discovered by the microscope.

This latter statement he proves by cases.

PENETRATING WOUNDS OF THE ABDOMEN.

BERGER (*Revue de Thérapeutique Chirurgicale*, No. 22, 58 An.) cites a new case of wound of the abdomen from a pistol-shot, recovering without operation. The ball was received in the epigastric region and was of small calibre. The patient vomited blood an hour after the infliction of the wound. Opiates and abstinence from food were ordered. In fifteen days the patient was well. Twice Berger has seen wounds of the stomach inflicted by balls of small calibre recover without operation. Once he observed a case of wound of the cæcum by a revolver-ball. This patient did not come under observation for five days; he then exhibted symptoms of mild peritonitis. No surgical operation was performed, yet the patient recovered. Five cases of wounds of the small intestine, by pistol-balls, were also seen by the reporter, also one case of knife wound. Laparotomy was performed in all of these cases. Five perished; one recovered.

The author concludes that gunshot wounds of the stomach and large intestine are much less grave than wounds of the small intestine. He believes that in large wounds penetrating the abdomen, if the surgeon sees the case he should operate at once. If he does not see the patient for four or five hours after the injury, his conduct should be based upon the condition. If there are no symptoms, no

operation should be undertaken, as spontaneous cure will probably occur. If there is effusion of blood, or signs of commencing peritonitis, immediate operation is indicated.

Verneuil recorded a case of penetrating wound of the abdomen, by a small bullet, resulting fatally in a few hours without either tympany or vomiting. The second case seen by him was stabbed in the abdomen, and came under observation twenty minutes later. The small intestine was wounded, the seat of injury being visible through the breach of the abdominal parietes. The loop of wounded gut was secured in the external wound. The patient died in thirty-six hours with distention characteristic of peritoneal septicæmia. The autopsy showed a large quantity of blood in the peritoneal cavity, but no fæcal extravasation, although the cæcum was wounded.

Réclus reported the case of a soldier wounded by a large ball; a preternatural anus was formed; the patient recovering without surgical intervention. Levasseur sent to Réclus the notes of four penetrating wounds of the abdomen, all of them recovering without surgical interference; three of these were gunshot wounds. In an experimental research Réclus found that the contents of the stomach injected into the peritoneum of guinea-pigs was always encysted, while the intestinal contents similarly injected invariably occasioned general peritonitis. Réclus believes that profound shock always denotes internal hemorrhage. Where this symptom is present he would operate, under other circumstances he would follow the teachings of Berger, since his own statistics gave fifty-seven per cent. of deaths in cases of immediate intervention, while in cases treated without surgical intervention the mortality is distinctly less.

Routier reports a case in which he opened the abdomen for gunshot wound eight hours after the accident; the wound of the stomach was sutured; the patient died in fifteen hours. At the autopsy another wound of the stomach and one of the small intestines was found. Peyrot instanced the case of a young man who received a gunshot wound of the belly, and who at the end of seven days—no surgical treatment having been adopted—seemed to be out of danger. On the eighth day there was fever, and about the second week there was evidently abdominal effusion. On opening the belly a diffuse purulent peritonitis was discovered. In spite of careful washing and draining the patient perished.

Dalton (*Annals of Surgery*, December, 1891) reports a number of penetrating stab and gunshot wounds of the abdomen treated by cœliotomy and the application of the proper surgical principles to the seat of wound.

The first case was shot at close range by a 38-calibre pistol. There was no shock. The belly was opened and eight wounds of the small and large intestine were found. The abdominal cavity was full of fæces and blood. It was thoroughly irrigated with warm Thiersch's solution, drained, and closed. With the exception of an acute pneumonia the patient recovered without any untoward symptoms.

The second patient was wounded in the liver with a 38-calibre pistol, at a distance of twelve feet. The ball entered the sixth intercostal space two inches to the left of the sternum, and passed downward through the belly cavity. Cœliotomy was performed, and two holes were found in the stomach. These were closed, a large portion of blood was washed from the perineal cavity, and the wound was closed without drainage. Forty-five minutes were consumed in the operation. The patient did very well for five days, when he fell out of bed, striking his abdomen. Severe pain developed at once; shock became marked, and the patient died twenty-four hours after the receipt of the last injury.

The third case attempted suicide by means of a 44-calibre pistol. The bullet entered the seventh interspace in the right mammary line. The abdomen was opened; the bullet was found to have passed through the right lobe of the liver, the lower opening was still bleeding at the time of the operation. Plugging with iodoform gauze was employed in the hope of stopping this hemorrhage. The patient recovered. The gauze was removed on the third day.

The fourth case received a 44-calibre ball in the left lumbar region. On opening the abdomen a single transverse wound was found in the colon; near this was found fæces and clotted blood. The opening in the gut was closed, the surrounding region was thoroughly cleansed, the peritoneal holes of entrance and exit were also closed. The patient made an uninterrupted recovery.

The fifth case received a penetrating knife wound in the median line, two inches below the umbilicus. Cœliotomy was performed; the intestines in the immediate vicinity of the parietal wound were found intact. There was some bleeding from a large vessel of the omentum. The abdominal cavity was drained. The patient did well until the third day, when a portion of the intestine prolapsed through the drainage-tube wound, occasioning a strangulated hernia, as a result of which death ensued.

The sixth case received a stab in the belly, half an inch to the right of the umbilicus. Cœliotomy was performed, and two holes were found in the ileum, showing that the knife-blade had passed through and through the gut. Blood and fæces were found in the peritoneal cavity. The openings in the gut were closed with a Lembert suture. The opening in the abdomen was closed without drainage. The patient made a rapid recovery.

In the management of gunshot wounds of the abdomen, Dalton holds that there are four critical points to be borne in mind, the strict observance of which will affect the issue of the case: 1. Have everything in readiness, the patient thoroughly prepared, the abdomen clean, and the surrounding surface covered with antiseptic cloths before the anæsthetic is administered. 2. On opening the abdomen the first thing to seek is the source of the hemorrhage. 3. As far as possible the intestine should be kept in the peritoneal cavity. 4. The operation should be finished at the earliest possible moment consistent with the proper management of the case.

Reviews.

A System of Practical Therapeutics. Edited by Hobart Amory Hare, M.D., Professor of Therapeutics and Materia Medica in Jefferson Medical College, Philadelphia; assisted by Walter Chrystie, M.D., late Physician to St. Clement's Hospital, and Instructor in Physical Diagnosis in University of Pennsylvania. Vol. I., General Therapeutic Considerations, Prescription-Writing, Remedial Measures other than Drugs, Preventive Medicine, Diathetic Diseases and Diseases of Nutrition. With illustrations.
Philadelphia: Lea Brothers & Co., 1891.

The publication of a system of therapeutics is an event. This field has not been overworked, and it is the real home-field from which, after all, we get all that is most useful to us and our clients. The scientific therapeutist may sneer at the practitioner and his love of the practical, but all his work will be tested, and either treasured or discarded by that humble individual.

The system before us, in its first volume, is devised on a plan quite unlike the ancient and time-honored therapeutic work, and almost equally unlike the modern favorites. It consists in a series of monographs by eminent men upon broad topics, and an enumeration of subjects and authors will give some idea of its scope.

The initial article—"General Therapeutic Considerations"—is by Dr. Horatio C. Wood, and, of necessity, is bright, thoughtful, and suggestive to the intelligent reader of many things he never thought of before, or thought of in totally different relations. The personal element, so valuable in an article where the person is the right person, is here seen at its best. Dr. Wood narrows all therapeutic methods into one of four lines,—empiricism, treatment by symptoms, scientific therapeutics, and, lastly, a combination of one or more of the preceding. Contrary to the views of some, "empiricism" is considered as the "*primeval* method." This may be so, or empiricism may have originated after a better, more scientific method was lost by degradation. He defines empiricism as the "using of a certain remedy in a certain disease because it has seemed to do good in similar cases." Yet, throwing aside, as out of the author's view, any possibility of early scientific method, it seems almost incredible that the body of valuable therapeutics we inherit should have been discovered in this way, the chances for error are so innumerable. In modern times a suggested remedy may be empirically tried and adopted, after extended trial, with some chance of being valuable, but without any leading suggestion or scheme or theory. Out of the vast number of samples, how did the early therapeutists arrive at the value of mercury in syphilis, for example, a value as great and as solitary to-day as ever? And this is only one among many instances. Even modern therapeutics is ever and anon bringing up some old discarded herb, and finding that antiquity was right. With our great hospitals and our medical societies and journals and our accurate science, we can test infinitely easier than the man of the middle ages. True, Dr. Wood does qualify his definition of empiricism—the "primeval method"—somewhat when he says, "From time to time, led by chance, by fanciful suggestions, *by mental influences unrecognized by their subjects*, men have given remedies," etc.; but this is supernaturalism, mysticism, anything but empiricism, unless he implies "suggestion."

The paragraph "On the Combining of Drugs" gives the author an opportunity to use some forcible language. He describes the "avalanche of unknown and unknowable power" in almost Spencerian language. "Who can tell what will be the resultant angle of force" in a polypharmic prescription? he pertinently asks; "multiplicity of combination is . . . the mark of the bungler and ignoramus." Citrate of iron and strychnine

is like "hitching together an ox and a race-horse."

"Prescription-Writing and the Combination of Drugs," by Joseph P. Remington, Ph.D., is a valuable article from the pen of a practical pharmacist on a topic which should interest all. We are so many of us deficient in just that technical knowledge,—that knowledge of incompatibilities and mysterious chemical reactions,—that an article of the kind may well be read with profit even by the most eminent and give him some valuable points. He may perchance learn why the prescription so mysteriously failed to work, or worked with any rather than his hoped-for results.

"Electro-Therapeutics," by A. D. Rockwell, A.M., M.D., covers the whole ground up to date, carefully and concisely. "The Rest-Cure for Neurasthenia and Hysteria," by Dr. John K. Mitchell, is a most excellent article, and "may be considered as an authoritative statement of the most recent views of Dr. S. Weir Mitchell." It studies the rest-cure and its methods and results in a practical manner, and as a guide and text-book on the subject is invaluable.

"Swedish Movement Cure and Massage" is by Benjamin Lee, A.M., M.D., Ph.D. It is well illustrated, and the subject is studied in its therapeutic applications.

"General Exercise" is by Edward Mussey Hartwell, Ph.D., M.D. "Mechano-therapy," as a descriptive term, has been revived or invented by Dr. Hartwell, who recalls the fact that "of old it stood above surgery." Dr. Hartwell's article is thoroughly scientific, and embraces the whole theory of muscle action and muscle power.

S. Edwin Solly, M.R.C.S., L.S.A., writes on "Climate." Few men have had better opportunity from education and location to study the subject in all its practical relations, and a thorough paper is the result. It is filled with personal observations, and the compared results of research and study. The author classifies climates into sea, island, coast, inland, and elevated, and, after their separate study, studies them in relation to disease. Perhaps it would be impossible to bring more accurate and useful information into the same space than the author has done under this heading, and in "Comparative Results of Treatment of Phthisis by Climate" and "The Altitude Treatment." There are also sections on "Nervous Diseases," "Kidney Diseases," and "Hepatic Diseases," with "Affections of the Stomach and Bowels;" and a thorough reading of the article will give any one new and useful ideas on the subject which may prove of inestimable value, since climate as a remedy is advised too often in a hap-hazard way, and, apart from phthisis, with too little knowledge of its real effects.

Those who are interested in "Hydrotherapy and Mineral Springs" will find much to interest and instruct in the article by Simon Baruch, M.D.

The author begins with a study of the causes of heat production, and the action of heat and cold. Without this preliminary work, it would be impossible to intelligently apply so powerful an agent. Like all scientific exponents of hydrotherapy, he would lift it far above empiricism into true science, and in this he succeeds. Of the value of the hygienic use of cold bathing, as a habit, he has no doubt. He calls this "hardening process," "neurovascular discipline," but "the exact *modus operandi* of the factors involved is unknown."

After a short sketch of "Public Bathing," the author passes on to "Hydrotherapy in Disease," giving an historical sketch, and discussing "The Rationale of the Action of Water." In this he tells us that the effect of water as a remedial agent is due to two things,—mechanical impact and temperature effects. The latter is the chief element, hence hydrotherapy is the science of the application of heat and cold in the most manageable way in the treatment of disease. What heat and cold can do, the author now carefully studies, and deduces certain guiding principles. We here, then, have something certain upon which to rest a careful study of "the reflex effects of cold upon cardiac action," "the influences of peripheral irritation on temperature," and "the effect of peripheral irritation on tissue metamorphosis," which give the student a fixed foundation, and the author passes on to the "Technique of Hydrotherapy." Here also he is thoroughly at home, and the various baths and packs and douches are described and illustrated.

The concluding portion is devoted to the application of these methods to diseases. Typhoid fever and pneumonia are studied as treated in this way. The author is a thorough believer in his subject, thoroughly and practically familiar with it, and has added a section of great value to the System. As an appendix, he gives a shorter account of "Mineral Springs," which, while concise, is full of valuable research.

The article on "General Sanitation," by Henry B. Baker, A.M., M.D., is one that fully satisfies every requirement of a work of this character. Its style is so easy, its lessons so simply yet impressibly taught, that it might well form the guide and text-book for all sanitary workers. It is adapted particularly to the untrained and unprofessional mind, and starts with the idea that it is necessary even to prove by evidence that sickness and death can be prevented. In this way it appeals even to that benighted class which is liable from our form of government to be elevated to positions of responsibility. Believing that Disraeli was right when he said, "The health of the people is the first duty of the statesman," the author considers the prevention of disease as necessarily a governmental function. Read the section entitled "What a Health Officer should know," and then consider what generally he does know. How often is his knowledge only that of the ward-worker and rising politician, and his position only a reward for, at best, dubious political services. We employ plumbers to do plumbing and painters for painting, but the business of protecting a large city from the inroads of disease is intrusted too often to one to whose ears the language of science is babbling and the discoveries of modern preventive medicine are meaningless.

Compulsory vaccination is opposed, in the case of adults, by the author, as "an interference with the liberty of the individual relative to his own person, not for the public good." Let others who differ, he says, be vaccinated and protected themselves, and let the recalcitrant individual suffer. Sometimes, however, in the recently exposed, it is necessary to insist either on isolation or vaccination for the protection of the public, but even here the author leans to allowing the alternative of freedom.

How far the disappearance of small-pox of late from certain large cities is due to efficient and general vaccination, or how far isolation and general exclusion of the sick from contact with the well have caused it, it is impossible to say. Certainly epidemics have broken out after periods of great immunity, and have raged with great violence. It is well to employ all possible means and to use both methods.

The author's "Outline of the Leading Principles applicable for the Prevention of the most Important Diseases" is an excellent guide for the student of this branch of medicine.

This article, together with the one on "Disinfection," by Geo. M. Sternberg, M.D., and the one following, "On Antisepsis and Asepsis," by J. William White, M.D., form a group of great value. Dr. White's article, while bringing the subject up to the date of issue, is moderate in tone, and fully discusses the failures and limitations of antisepsis and their reasons. In gonorrhœa he believes that we may assume "that a successful treatment by germicidal agents will involve the destruction of all the different varieties of germ present, and that this special difficulty can be best overcome by a "combination of antiseptics," "sublimate, boric acid, and sulphocarbolate of zinc in peroxide of hydrogen," combined with the internal use of salol and boric acid with the oleo-resins of cubebs and copaiba. This does look a little like polypharmacy, but the end justifies the means.

"Nutrition and Foods, including the Treatment of Obesity and Leanness," by I. Burney Yeo, M.D., F.R.C.P., is a long and very elaborate article that will be appreciated by every reader.

The presence of the article on "Tuberculosis," by Solomon Solis-Cohen, A.M., M.D., in a therapeutic work of this character, may seem an anomaly, but the article in question is written so thoroughly from a hygienic and therapeutic stand-point that its great value is at once seen by the reader. In fact, tuberculosis and its prevention and cure is the great question of the day. A very cursory recollection of the tubercular excitement will convince any one that this question comes nearer to the heart of the public than any similar one connected with other diseases. Tuberculosis is the modern plague, the nineteenth century leprosy, always with us.

Dr. Cohen's views are conservative. The bacillus is for him only a factor; it is independent of microbes. The determining element is susceptibility. This is a bad name. "It is in itself a disease." "It is a negative, not a positive state." "What is wanting is life force, vital energy," as fully known "to exist by its manifestations as we know electric energy to exist." This condition or disease, the author, with Jaccoud, agrees to call "Hypotrophy."

Hypotrophy may be a useful word, and may be the best word to be had, but it is a bad word, that, like a bad little child, should be seen rather than heard, if we would catch its meaning and avoid confounding it with "hypertrophy." Each generation in medicine, the author tells us, speaks a language

of its own. A barbarous jargon to its successors. The jargon of our day is well illustrated in the following sentence: "Acquired hypotrophy depends upon an excess of katabolergy or a deficiency of anabolergy."

Hypotrophy is due to depression, privation, or excess. The author considers that "the prophylaxis of tuberculosis begins before conception." The above causes in the parents will lead to the condition in the offspring, besides inducing an acquired susceptibility in the parents themselves. In regard to contagion, he says, "There is no such thing as transmission of tuberculosis by contagion, in the ordinary acceptance of the term," for only hypotrophic subjects are liable. The question of food—tuberculous milk and meat—is carefully considered, as is also the disposal of sputum and the general avoidance of exposure. He endorses the contagion school, but would recommend "tenderness" in carrying out its mandates.

"How to Reinforce Vital Energy" gives us very valuable and carefully-formulated directions, while the "Therapeusis of Hypotrophy" covers the whole ground of hygiene in regard to this condition, such as residence, light, food, exercise, rest, occupation, amusements, choice of a vocation. The remedial agents—drugs and methods—are then as thoroughly described, and as one reads there is no longer a question as to the propriety of an article on tuberculosis in a "System of Therapeutics." The study of the action of compressed air will commend itself to many inquiring readers, with the oxygen, chlorine, fluorine, balsams, and other treatments. The text on the subject of pneumotherapy is unusually full and well illustrated, and the study of treatment is carried on to the last stages of the fatal disease. The article is very long, covering over two hundred pages. From beginning to end it is hopeful. Its key-note is struck in the opening sentence: "Tuberculosis is a curable disease."

"Scrofulosis and Rachitis," by Walter Chrystie, M.D., is a very excellent, though short, monograph. "Acute and Chronic Articular Rheumatism, Rheumatoid Arthritis, and Gout," by James Stewart, M.D., and "Diabetes Mellitus," by Frederick A. Packard, M.D., form another group of excellent articles, which conclude Vol. I., and leave a desire for more, which can only be appeased by Vol. II. The reader can judge, even from this hasty notice, what a mine of therapeutic treasures are opened to him. The difficulty of obtaining actually new material in any medical work is acknowledged, but there are times when new arrangement and the presentation of scattered facts in new groups and masses possess almost the value of new discovery. This is the method of this work, and it seems to us immensely successful.

E. W. W.

PULMONARY CONSUMPTION A NERVOUS DISEASE, CONSIDERED AS SUCH FROM A PRACTICAL, A CLINICAL, AND A THERAPEUTIC STAND-POINT. By Thomas J. Mays, M.D., Professor of Diseases of the Chest in the Philadelphia Polyclinic and College for Graduates in Medicine, etc.

Detroit: Geo. S. Davis, 1891.

It certainly requires considerable nerve in these days, when the bacillus of tubercle is as firmly believed in as any discovery of the nineteenth century, to write a book for the purpose of proving that phthisis is a neurosis; yet the more carefully one reads the book, and the more one thinks about it, the more tenable becomes the position of its author. The title is a little too *ad captandum* to express his real object, and his own preface gives a much more reasonable and lucid explanation of his belief.

"Pulmonary consumption," he says, "is not due to one single cause." This nobody will dispute who has thought far enough to perceive that inevitably two or more causes unite in the production of most of the diseases, accidents, and events of existence. The author grants all the predisposing power of inheritance, excesses, bad food, want of exercise, etc., but holds "that in many, and probably in all, such patients a disturbance of the nervous system plays either a causative or a concomitant *rôle* in its history." The author's first effort, then, is to prove a "relationship between consumption and the nervous system." A case is given, which first really gave definite form to the author's idea,—a case which exhibited what might be termed the struggle between a nervous disease and phthisis for the mastery. The symptoms alternating between neuralgia and lung symptoms for some time, the case terminated in death, but as no autopsy was made, it is still open to the reader to suggest that there were really two distinct conditions present,—one when the pain began after a delivery, in a violent pain in the region of the right ovary, which might have been a latent appendicitis with encysted pus later, for chills and night-sweats followed an apparent recovery; and the other, a secondary pulmonary deposit, which at first cleared up, but returned again before the fatal event. The alternation under this supposition would have

been due simply to the well-known difficulty of experiencing the symptoms and pain of two widely-separated diseased centres at the same time.

Dr. Mays by no means claims the idea of "phthisis as a neurosis" as original, for he quotes Dr. Clifford Albutt as writing under that heading in 1871. The introduction also contains another "leading case," which occurred in a lady broken down "by nursing one who was very dear to her," who died, and who herself, after a three weeks' illness, died also, with consolidation of both apices; but at the autopsy there could not be found "a single tubercle in the body," but "the apices of the lungs were almost destroyed, and less degrees of mischief were found below." As this book was published in 1891, and the case is cited as one of "a year ago," it seems pertinent to ask, first, of what disease did the individual nursed by this case die? and, second, knowing the prevalence of influenza and its vagaries during the last three years, did not the patient have a lung degenerated by the influenzal process, since no tubercle could be found?

Dr. Mays has done the medical world a service in calling attention once more to the "relation between insanity, hysteria, headache, neuralgia, and consumption," as we find these diseases grouped in the head-lines of his second chapter. No one who observes will question such a relationship, or the equally important one with "Inebriety," which he gives us later. The great chronic and wide-spread persistent constitutional diseases and vices alike inhere to poor constitutions, sometimes in one line, sometimes in another. The victim of the legacy of a weak constitution seems obliged to tread some one of the downward paths. All this, however, by no means proves that phthisis is a neurosis independent of the bacillus, predisposition has always been granted as a necessary factor in its production. The author quotes Pidoux as saying that "neurosism" often acts as a moderating agent, and in such subjects phthisis has a very slow development. Largand is quoted as saying, "We shall show how consumptives, even when most threatened, may live, thanks to hysteria." These and many more authors are cited by Dr. Mays to prove the co-existence of phthisis with other neuroses. That the displacement of hysteria by consumption, and *vice versa*, is not evidence of an "inherent antagonism" is proved by Dr. Mays by an allusion to the disappearance of cough and pulmonary symptoms at the onset of diarrhœa, or the "appearance of a delayed catamenial flow," or the suspension of the progress of phthisis by pregnancy; but further on we find him using the occurrence of diarrhœa in phthisis as a proof of the neurosal theory.

While here he says, "To account for these interchanges in the score of an underlying diathesis would be in no greater harmony," etc.; yet further on he does account for them in this identical way. Dr. Ambrose L. Ranney, whom he quotes as saying, "Many diseases which are to-day commonly regarded as of bacterial origin owe their development to some *underlying cause that has impaired the nervous function*, and this rendered the patient peculiarly susceptible to deleterious atmospheric influences," might as well have said, and thus rendered the patient non-resistant to bacterial influences, and then all would have agreed with him. Dr. Mays would not have quoted him, and yet he (Dr. Ranney) would have said the same thing, only in different words. But Dr. Ranney has his own theory, and "never yet encountered a case of typical phthisis in which eye-strain did not exist as a factor more or less potent."

Dr. Mays in chapter iii. endeavors to show "the relation between disease of the vagi and consumption and other pulmonary affections." Of his efforts it may be said that if, as many seem to coincide in thinking, nerve-trunks are affected in influenza, he has had performed under his eye experiments on the results of disease of the vagi on the lungs many hundreds of times ere this, and can without dispute announce that a "phthisis" has in this way often resulted, but not by any means a "tubercular phthisis."

"The Relation between Alcohol and Consumption," forming chapter iv., deserves more than passing attention, since a thorough understanding of it must form the basis of any future intelligent legislation upon the temperance question; for as surely as inebriety gives the inebriate children a legacy of phthisis, so surely does phthisis leave in the offspring of the phthisical an inheritance of alcoholism, or a strong bent towards it, and an equally strong case may be readily made out for insanity. Alcoholic neuritis, in Dr. Mays's opinion, is often at the basis of lung degeneration, inherited or acquired. In chapter v. syphilis is similarly considered, and "syphilis, like alcohol, unquestionably has a specific affinity for the nervous system. . . . It, like alcohol, produces the lung lesions through the pneumogastric nerves.

Diabetes, epilepsy, beriberi, leprosy, lupus, pellagra, mercury, lead, etc., are all studied in

succeeding chapters in their relations to pulmonary consumption. The author seems to confound the tubercle of tubercular leprosy with the tubercle of phthisis, treating them as one and the same thing; but perhaps his language is unintentionally vague.

The symptoms of consumption are next studied from a nervous stand-point. Here the author has collected supporting evidence from many sources. The diarrhœa, the early hæmoptysis of lung-disease, are all made to show defective nerve influence in hæmoptysis, defective nutrition of the blood-capillaries due to impairment of the trophic nerves. The experimental evidence "that section of the vagi is followed by a broncho-pneumonia, which frequently becomes cheesy," is given. Then "pneumonia caused by vagus section contains micro-organisms, which, on being inoculated, reproduce the disease in healthy animals." Here the author's argument is peculiar and, we think, defective; but that he firmly believes in the theory announced in his title is shown by the following sentence: "The testimony which has been collected thus far lends no encouragement to the belief that pulmonary consumption is a disease which is created by a specific virus, but rather that it is a condition which evolves slowly out of pre-existing pulmonary disorders."

Inoculation of phthisis does not, in the author's view, interfere with his theory. He explains that by certain facts in grafting in the vegetable world. But in the chapters on the "Pathology of Tubercle" and "The Bacillus as a Cause of Consumption" he reaches the acme and full development of his views, sustaining his belief, and harmonizing it with the well-known facts of the inoculability of tubercle. Food infection, house infection, the infection of husband by wife, and *vice versa*, are all explained away. Much stress is laid upon the failure of the experiment in Naples, begun in 1782, of isolating consumptives. Quite another view may be taken with equal assurance; but it is quite evident, without going any further, that the author is able to explain anything, and that all statistics are well-known facts. All careful observations are speedily hypnotized, and range themselves at his suggestion just where they will help him most.

As running parallel to the line of thought in Dr. Mays's book, we might compare, not contrast, with his views, recent observations on influenza cases. Here it seems most probable that we have to do with a disease, microbic or not, leading to disorganization, or, at least, obstruction of main nerve-trunks. That implication of the vagi is the cause of the peculiar pulmonary troubles seems the most reasonable view to take. The same arguments that the author uses to prove phthisis a neurosis, can consequently be used to prove influenza a neurosis. Even his elaborate argument in regard to the sweating and diarrhœa of phthisis may be used with equal force in regard to these symptoms in influenza, and it seems to afford us a view of a probably microbic disease, not attacking a few here and there, but extremely widespread, yet acting ultimately by its direct or indirect effects upon nerve-trunks, and it may possibly suggest itself to some thinker whether the same mechanism may not be brought into action as the direct result of either the bacillus of tubercle or the poison generated by it. If so, the author's labored theories fall to the ground, since his neuroses would after all be but consequences, not causes, of pulmonary phthisis, consequences directly following on the lodgement of the bacillus.

E. W. W.

THE MICROSCOPE AND ITS REVELATIONS. By the late William B. Carpenter, C.B., M.D., LL.D., F.R.S. Seventh edition, revised and rewritten by W. H. Dallinger, LL.D., F.R.S.
Philadelphia: P. Blakiston, Son & Co., 1891.

The reappearance of this well-known work in new dress, revised by so competent a worker as Mr. Dallinger, will be greeted most heartily by all workers in this branch of science. There has been no other work in the language that could at all approach the previous editions, and the bringing up to date of all important features and the omission of obsolete material has vastly enhanced its value.

The first one hundred pages of the work are devoted to a concise, clear, and complete study of the mathematical and practical optics applied in the construction of microscopes. As this includes the views advanced by that distinguished practical optician, Dr. Abbe, it affords to the English reader a compilation of many interesting monographs not at present elsewhere obtainable. Aside from Dr. Abbe's views, it contains much of value in the way of practical working formulæ.

Chapter iii. contains a complete history of the microscope, and is so fully illustrated that we are shown all the forms of popular stands used at the present time, which, contrasted with earlier forms, affords ample study for those who enjoy a review of the past.

Chapter iv., devoted to accessory apparatus, is very full and complete. A most useful example is seen in the forms and uses of the mi-

crometer, an instrument used too little, and still worse, misused. Other accessories are very fully considered.

Chapter v. is devoted to objectives, eye-pieces, and apertures, with methods of testing and measuring lenses.

Chapter vi., on practical microscopy, manipulation, and preservation of the microscope, is vastly superior to any of which the writer has any knowledge. No microscopist can afford, if he owns valuable apparatus, to be without this chapter. It is replete with information which will save, if followed, many times the cost of the book in ruined or damaged lenses or stands. The directions for illumination are simply invaluable.

Chapter vii. deals with the preparation, mounting, and collection of objects, and fully describes the various technique. One could easily find fault in the bacteriological staining methods given, but completeness in this would have robbed other parts of the book of material more valuable to the general worker. This chapter terminates the general considerations, and is followed by chapters on the microscopic forms of vegetable life and similar chapters on animal life.

A short chapter follows on vertebrated animals, which, as the author states, is not intended "for the professional student, but only for the amateur who wishes to gain some general idea of the elementary structure of his own body and of that of vertebrate animals generally."

Chapter xxiii. deals with geological microscopy. There are seven appendices, in the form of rules, for the conversion of metric to English weights and measures, and various optical formulæ, all of which are of great value. To all this is added the most complete index it has ever been the writer's good fortune to see in so large a book, embracing, as it does, one thousand and fifty pages of reading matter. The illustrations are good and the typography entirely satisfactory. While it is to be remembered that this is not a book for any particular line of work, it is useful in all lines, and no microscopist can better improve spare moments than by its perusal. The editor is to be congratulated upon improving and advancing a book already the foremost in its line in the English language. W. M. L. C.

THREE THOUSAND QUESTIONS ON MEDICAL SUBJECTS, ARRANGED FOR SELF-EXAMINATION, WITH THE PROPER REFERENCES TO STANDARD WORKS IN WHICH THE CORRECT REPLIES WILL BE FOUND. Philadelphia: P. Blakiston, Son & Co., 1891.

This work is anonymous, but the publishers vouch for the fact that its compiler is a "medical man, a teacher, and a writer of experience." The book is very small,—three inches by four inches in size,—and can be carried, if desired, in the vest-pocket. With such a help, who would fail to regard the admonition, "Know thyself?" It is interleaved, and the self-examiner can write down on the blank page his answers, necessarily concise, to the questions opposite. The only hitch comes when, after a careful examination, the examiner finds himself quite unable to pass himself or to give himself a diploma. Were a diploma attached, some bright souls might be speedily converted into self-graduates, if only the state and the public would recognize the document. But, in short, to gain a good idea of how little one knows, buy the book and read it carefully. E. W. W.

Correspondence.

LONDON.

(From our Special Correspondent.)

Research in London—Lectures at the Thames Embankment—Dr. Woodhead on the Functions of a Laboratory—The Croonian Lectures—The Phagocyte Theory of Immunity—Dr. Ruffer's Lecture—Epidemic Eczema—A Journal of Pathology—The Action of Absolute Chloroform and of Chloroform Residues—The Influenza Epidemic—Hyoscyamine in Lettuces—A Physiological Styptic—Means of increasing Coagulability of the Blood.

An interesting series of lectures has just been commenced in connection with the new research laboratories of the Royal College of Physicians and Surgeons. It may be remembered that these were endowed by the colleges to enable men to work at any subject of therapeutical, pathological, or surgical interest without the necessity of leaving the country for the purpose. The researches are aided in a most generous way, and all workers find a friend and adviser in the director, Dr. G. Sims Woodhead, who has already won laurels in a similar position at Edinburgh. The first lecture was given on December 7 by Dr. Woodhead. He dealt mainly with the functions which a research laboratory should fulfil. He asks us to regard it not as a mere workshop, where men can carry out their own ideas, but as a common ground for the discussion of scientific problems and the interchange of ideas thereon. He maintains, I think rightly, that much of the unworthy struggling for priority and jealousy between workers is the outcome of that secretiveness too often fostered

in some of the continental laboratories. Following this, he gave a brief sketch of the work done during the year, and it is a record of which London may justly be proud. I shall take the opportunity of reporting some of these researches in this and perhaps subsequent lectures.

I had intended to continue my account of the Croonian lectures, recently delivered by Dr. Burdon Sanderson. There is, however, much demanding notice, so that I must restrict myself to a few lines only on this subject. One thing I may say about them is this: The main feature of the whole series was the vigorous attack on the doctrine of phagocytosis, as applied to the explanation of pathological processes, and the strong favor shown to the theory which would attribute the "antibiotic power" of the organism to an action exerted by the fluids of the body on invading microbes. Hardly a pathologist of standing will, he said, accept the doctrine of phagocytosis as enunciated by Metchnikoff. This was, however, carrying the matter a little too far. Truly, few would admit the doctrine as described by Dr. Sanderson, but Metchnikoff's theory does not necessarily demand that "consciousness of the leucocyte," etc., which the scoffers are so fond of talking about. Omitting these "adornments," not even required by the originator of the doctrine, the younger race of pathologists is showing a very strong tendency to accept Metchnikoff's views. With modern methods and laboratories at their disposal, they are able, step by step, to test the truth of evidence as it is brought forward, and to base their opinions in great measure on their own work.

Dr. Armand Ruffer, the second lecturer in the course inaugurated by Professor Woodhead, is a stanch supporter of the phagocyte theory, and has given further evidence of its truth. His observations have been made with the disease known as quarter-evil, a malady affecting chiefly young cattle, and due to a very specific bacillus,—the *bacillus chauvæi*. His experiments have been made principally on rabbits, which have been found to be relatively immune to this disease, and are therefore very suitable for the study of the effects of the living fluids and cells of the body on the virus. If immunity in the rabbit be due to the unsuitability of its tissues as a nutrient medium for the bacillus, then this microbe when inoculated ought not to grow at all, or but sparingly at most. If the immunity is due to a bactericidal power residing in the animal's fluids, then degenerated bacilli should be found in the fluids near the point of inoculation; but if the resistance is due to the action of cells alone, then the bacilli should grow freely in the fluids, but degenerate within the cells. To ascertain what actually happened, Dr. Ruffer adopted the novel method of enclosing the infecting material in small cases of filter-paper, sealing their open ends with paraffin, and inserting them under the skin of rabbits. The fluids of the body could then readily get at the virus, but the leucocytes were almost entirely excluded by the filter-paper. In this way he found, on removing the cases, after leaving them for from twenty-four to forty-eight hours *in situ*, (1) that the bacilli multiplied very readily within the cases, although bathed in fluids; (2) a very few leucocytes penetrated into the cases, the outer surface of the filter-paper being, however, crowded with them, attracted to the spot by the poison formed by the bacilli; (3) in the substance of the paper, where leucocytes and microbes met, cells were to be found gorged with microbes which showed signs of degeneration. The most advanced of the leucocytes showed also signs of degeneration, proving conclusively that they had suffered in their battle with the bacilli. Experimenting in this way, Dr. Ruffer found that the rabbits did not die of quarter-evil, though the virus remained for a long time under their skin; but if the filter-paper were ruptured, then the animal succumbed within a short time to quarter-evil. It was ascertained, further, that growth, as above described, in the fluids of a living rabbit, was a sure means of increasing the virulence of the bacillus, for if a weighed quantity of the infecting material (found by control to be insufficient to kill a guinea-pig) be wrapped in filter-paper and allowed to stay for some hours under the skin of a rabbit, a trace of the contents of the packet will then suffice to produce the typical disease in guinea-pigs. The evidence on this point seems very conclusive,—that the fluids of an animal refractory to the bacillus of quarter-evil have no bactericidal action on the microbe, but, on the other hand, produce very marked increase of virulence.

Supposing, now, that a large dose of very virulent material be inserted into a rabbit, and a careful examination be made of the seat of inoculation a little while after. Here a perfectly different state of things will be observed to what happened when the virus was inclosed in a paper case. A very rapidly

fatal disease will have been produced, the bacilli lying *free* in the fluids, and there will be almost complete absence of leucocytes in the exudation. Using in other animals either a small dose of virulent material, or a larger one of attenuated virus, the phenomena of phagocytosis are again observed, it being often difficult under these conditions to find a single free bacillus. How can this difference be explained?

This question is intimately involved in that other one about which so much contention has raged,—the cause of the assembling of leucocytes round an infecting focus. Let us here admit, with Dr. Ruffer, the existence of a "chimiotactic" power, positive or negative, of the poisons formed by microbes. We may then assume with him that the large amount of virulent material when introduced produces an active poison in quantity and intensity sufficient to repel the leucocytes from the point of infection. In the case of the smaller quantity, or less virulent material, the poison formed attracts the leucocytes by reason of its lesser amount or lesser concentration. That this is so seems to receive confirmation from some other experiments of the lecturer, who found, for the familiar chemical irritants that in feeble concentration these produced attraction of leucocytes to the site of injection, whereas in strong concentration they exerted a decided negative chimiotactic action.

Another fact has also come strikingly to confirm the phagocytic view of immunity, and is indeed a very important link in the chain of evidence. It was shown by Arloing that if the virus of quarter-evil has lost its virulence, it can be again rendered virulent by immersion in lactic acid. That this is due to a repellent action of the lactic acid towards leucocytes was proved by Dr. Ruffer in the following manner: Two small sponges were sterilized, one being soaked in lactic acid, and both then inserted under the skin of a guinea-pig. After six hours the sponges were removed and the contained exudation examined. That from the plain sponge contained crowds of leucocytes, while that from the acid sponge contained none at all. By a modification of this experiment he proved that its action is the same when injected along with quarter-evil. Wrapping up the virus as before in two filter-papers, but leaving one of the ends of each open, and soaking one of them, with the contained virus, in lactic acid, he inserted one into either flank of an animal, leaving them there for twenty-four hours. Killing the animal, he found a slight tumor round the acid-bag, the other flank being nearly normal. The plain bag was surrounded by leucocytes, showing all stages of phagocytosis; the other was surrounded by copious exudation, hardly any leucocytes, and these empty, and by large numbers of free bacilli. It is almost certainly in the same way that the poison of quarter-evil acts, not by producing paralysis of leucocytes, but by repelling them from its neighborhood; at any rate, Dr. Ruffer's experiments with the filtered germ, free exudation on sponges,—similar to those used in the case of lactic acid,—seem to show this.

The lecturer's conclusions were, therefore, as follows: 1. A small quantity of virus is entirely dealt with by phagocytes, and by these alone, in the case of a partly-resistant animal. 2. Whereas the *dead* fluids of rabbits possess bactericidal powers for the bacillus of quarter-evil, the *living* fluids have no such action, but quite a contrary one. 3. An active virus secretes a poison, which, exerting a repellent action on leucocytes, enables the bacilli to grow unmolested in the living fluids of the body. 4. Leucocytes thus repelled are not, however, paralyzed, for they are quite capable of acting as phagocytes to a different virus—say *bacillus pyocyaneus*—introduced into another part of the body. 5. The doctrine of phagocytosis, notwithstanding the influence of eminent pathologists here and in Germany, is steadily gaining ground in the opinion of scientists.

I have devoted considerable space to an account of this lecture, for it deals with a subject which is at present affording food for reflection to men of all nations, and I think that fresh evidence of the nature described above cannot be too widely known.

A very curious and indeed fatal outbreak of epidemic skin-disease has recently occurred in the Paddington Infirmary. Of eight hundred and forty-six patients who were either in the infirmary, or had passed through it during the epidemic, no less than one hundred and sixty-three, or nearly twenty per cent., became attacked. The eruption is essentially a more or less general dermatitis, commencing generally with discreet papules, which may pass into vesicles, and always end in extensive desquamation of the epidermis. It is attended by a certain amount of constitutional disturbance, and runs a course of about seven weeks. Relapses have been very frequent, the disease having undergone recrudescence in thirty-eight out of the one hun-

dred and sixty-three cases observed. The chief and most constant constitutional symptoms have been anorexia and prostration. The death-rate has been high,—12.8 per cent.,—the two constitutional signs of lethal import being tremor of the limbs and embarrassment of respiration, without physical signs to account for it in the lungs. Treatment seems to have been of little avail when once the disease got a firm hold, but in the earlier stages antiseptics gave favorable results. As to the pathology of the affection, Dr. Saville, the medical superintendent who has described the outbreak, cannot speak with absolute certainty. All the symptoms seem to point to its contagious nature, but the sick and aged were far more frequently attacked than the young and robust. The epidemic has come and gone in a wave, but not without leaving its sad record behind.

Before many weeks have passed a new journal of pathology will make its appearance, with an editorial staff including the leading pathologists of the United Kingdom. Such a publication is much needed, as it will prevent the loss of much good English work by publication in other languages, which has hitherto been frequently necessary from the absence of a journal of this kind.

An interesting meeting of the Physiological Society was held in London on the 12th inst. One of the most important papers was a description by Dr. du Bois-Reymond of the physiological effects of the new "Pictet's" chloroform and of the impurities separated out during its manufacture. It will be remembered that Pictet has recently shown that even the purest commercial chloroform is not "absolute," but can, by the action of intense cold, be separated into two portions, —a crystalline (absolute chloroform), and a liquid, which contains the impurities. Both these portions have been tested physiologically by Dr. du Bois-Reymond, who finds that the pure chloroform, as compared with the purest commercial duty, is toxic only in the proportion of 7 to 10. The impure residues are, however, highly poisonous, and it is likely that many of the untoward effects of chloroform administration may be due to these bodies. In view of the large number of recent deaths under chloroform, these researches of Pictet and of Du Bois-Reymond become of the highest interest. It is to be hoped that the profession will soon have an opportunity of testing the new chloroform for themselves. A detailed account of the results which have been obtained with it will shortly appear both in German and English.

We are again having an opportunity for research into the nature of influenza, which is occurring in epidemic form in many parts of the kingdom. In London we have no more than occasional cases, but the victims are very numerous in the north and west. Belfast seems to be especially favored, and the disease is taking a very virulent form. The death-rate has risen in that city to 45 per 1000, which is about twice the average. In one house also in Scotland I have been informed that sixteen out of a family of twenty-three have recently had the disease, and this is no exceptional instance.

The Research Laboratory of the Pharmaceutical Society is doing very valuable work. The latest published results are by Mr. T. S. Dymond, who has established beyond doubt the presence of hyoscyamine in several varieties of lettuce. The amount in the young plants is, of course, very small, but in the green extract of the Pharmacopœia the mydriatic alkaloid is present to the extent of .02 per cent.,—quite an appreciable quantity. This is extremely interesting, for, although the narcotic properties of lettuces have been known for years, it has not before been shown to what these properties were due. Now that we know of the presence of this alkaloid, we may, perhaps, more easily understand the serious and sometimes fatal results which have sometimes followed the immoderate consumption of lettuce.

Physiology is often accused of being rather an unpractical handmaid to medicine. Frequently this is only too true, partly because physiologists are not always physicians, or *vice versa*, and partly because our knowledge is too incomplete on many points to allow of its application in practice. Under these circumstances I am glad to be able to chronicle an eminently practical research by Dr. A. E. Wright upon a physiological styptic. It is a curious fact that fibrin ferment should not before have been suggested as a means of arresting accidental hemorrhage. The properties of this body have been known for some considerable time, yet nobody thought of applying them. Dr. Wright's new styptic is the outcome of considerations on the factors which determine coagulation. It occurred to him that the best way of controlling hemorrhage would be to imitate as closely as possible one of nature's own methods and produce natural coagulation in the wound. Now, the addition of fibrin ferment to the blood is in itself suf-

ficient to hasten its coagulation. We know, besides, from the brilliant researches of Arthurs and Pagès, that the coagulability of blood is dependent on the proportion of lime salts contained in it, blood absolutely deprived of these being uncoagulable. Combining these two ideas, Dr. Wright has prepared his styptic, which is a solution of fibrin ferment, together with one per cent. of calcium chloride. The efficiency of this solution, when applied to severe wounds in animals,—such as division of all the veins of the neck, of a lobe of the liver, of the central artery of a rabbit's ear, etc.,—is, as I have myself seen, very remarkable; a small quantity applied with a swab of cotton-wool being almost immediately sufficient to arrest the hemorrhage, which is ordinarily very profuse. The solution—for the benefit of those who wish to try it, and I should recommend surgeons to do so—is prepared as follows: The blood of cattle or sheep is received direct into about three times its volume of water, is set aside to gelatinize for a few moments, and then thoroughly whipped with twigs. The fibrin thus obtained is gently washed, so as to free it from blood pigment, and then extracted for about twenty-four hours with five to ten volumes of water. To the filtered extract is then added one per cent. of calcium chloride. The great advantage, besides its efficiency, is that the process of occlusion by a natural coagulum is one which is calculated to do least harm to surrounding tissues. The action of the styptic is perfectly selective, being exerted on nothing but the blood with which it is brought in contact. No other styptic so thoroughly fulfils this condition.

Another outcome of Dr. Wright's experiments is an addition to our knowledge of the means of producing increased coagulability of blood in the vessels. The power of doing this at will would be very valuable in a variety of conditions. It might be supposed that coagulability might be increased (1) by injection of fibrin ferment; (2) by injection of any substance which contributes to the organic substratum of fibrin,—for example, of Wooldridge's tissue fibrinogen; (3) by injection or administration of lime salts. Some of these means have been already tested by other observers. Thus, fibrin ferment, far from producing increased coagulability, causes when injected an abnormal fluidity of the blood. Tissue fibrinogen, too, although under certain conditions it very greatly increases coagulability so as to produce intravascular clotting, if a quantity be introduced insufficient to do this, very little effect is produced. The administration of soluble calcium salts has, however, been found by Dr. Wright to have a very remarkable influence on coagulability, either when injected or given by the mouth. So struck is he, and others who have seen his experiments, that he is inclined to think that calcium chloride may afford valuable assistance in a variety of clinical conditions requiring arrest of hemorrhage. Possibly, although at present one has only the results of experiments on animals to rely upon, calcium chloride may be of service in such conditions as hæmoptysis, placenta prævia hæmatophilia, hæmaturia, and in anticipation, perhaps, of surgical operations. Possibly also, as Dr. Wright laughingly suggests, the eve of a battle might not be a bad time to saturate one's self with calcium salts.

A FEW REMARKS ON THE COMMUNICATION OF DR. A. RIXA REGARDING THE TREATMENT OF HAY-FEVER.

To the Editors of the THERAPEUTIC GAZETTE:

DEAR SIRS:—In the issue of this journal of December, 1891, Dr. Rixa, of New York, published an article on hay-fever, referring to former publications, in which he explains how useless the treatment has been in cases of hay-asthma. He now brings before us a new remedy that at last realizes all expectations. This remedy is terpine hydrate. He says, in his "Further Contribution to the Therapeutics of Hay-Fever," "In my previous contribution of hay-fever I endeavored to show by what method I succeeded in preventing the development of hay-fever, but also declared that I have been powerless in the hay- or reflex asthma, the most distressing complication of this painful disease. However, this year, I believe, I have a very efficient preparation, which controls the disease in a very surprising manner. The remedy I have referred to is terpine hydrate."

Then he gives us the chemical formula, and attempts a physiological explanation of the result of its application. Dr. Rixa fails to cite any authority, and every reader must naturally regard him as the originator of the terpine hydrate,—*i.e.*, in doses of 15 to 20 grains. This is an error. He simply made use of one of my communications, and was unjust enough not to mention my name in connection therewith. In protecting my rights, I consider it proper to thus inform the profession.

There is an article in the *New York Medical Journal* of December 12, 1891, which treats of the use of terpine hydrate in the asthmatic stage of hay-fever, by Hugo J. Loebinger, M.D. In this article I said that, upon my arrival in this country two years ago, I was somewhat puzzled when confronted with a case of hay-asthma, which disease rarely makes its appearance on the European continent, and that no American text-books furnished me with a knowledge of any effective remedy. I resorted to the terpine hydrate, which itself is well known here, but very little known as regards the quantities in which it should be administered. It has been given in small doses (see Schieffelin & Co., New York, samples of 2-grain soluble pills of terpine hydrate).

Lépine and Germain Sée, in France, and Lazarus and Manasse, in Germany, were the first to point out the correct dose of the remedy,—15 to 20 grains,—and also its utter harmlessness to the patient. They restricted the employment of this remedy to cases of phthisis and whooping-cough. I was the first to use this remedy—terpine hydrate—in the aforesaid correct and only efficacious doses for hay-fever, being guided by the idea that the terpine hydrate in large doses produces a copious expectoration, and thereby also an artificial relaxation of the bronchial spasms, which are the foundation of the asthma, thus leading the asthma into the condition of a common bronchial catarrh. I will here remark that Dr. Rixa's explanation that small doses create secretion and large ones restrict it is incorrect.

I regret to be obliged to give the following explanation:

Commencing to experiment two years ago with terpine hydrate, I told Dr. Rixa, in the presence of witnesses, of the surprising results I obtained from these experiments, and which, by the way, were then unknown. Some time afterwards Dr. Rixa reported to me similarly favorable results in his practice through the use of my remedy. As the doctor remarked to me that he was going to publish his experiences, I took it for granted that justice would be done the author of the remedy, according to the laws and ethics of the profession. This not having been done, I take the liberty to correct Dr. Rixa's communication.

HUGO J. LOEBINGER, M.D.
170 EAST SEVENTY-FIFTH STREET,
NEW YORK CITY.

SODIUM SALICYLATE FOR PLEURAL EFFUSIONS.

To the Editors of the THERAPEUTIC GAZETTE:

DEAR SIRS:—Apropos of an article in the GAZETTE for December, 1891, entitled "The Use of the Salicylates in Pleurisy," I beg leave to report the following case:

Two years ago a Swede, by occupation a coal-miner, consulted me for shortness of breath, weakness, and inability to work. He was pale and anæmic, and, upon examining him, I found that there was flatness on percussion over one side of the chest, and the respiratory murmur was absent. Having recently read in a medical journal that salicylate of sodium acted well in getting rid of pleuritic effusions, I resolved to try it, and ordered him twenty-four capsules, each of which contained seven grains of salicylate of sodium. Of these capsules he took from two to three a day, drinking a tumblerful of water with each dose, so as to dilute the medicine and prevent it from irritating the mucous membrane of the stomach. After taking all the capsules, he called upon me again, and on examination I was surprised and delighted to find that the effusion had completely disappeared and that the respiratory murmur had reappeared.

The result of the treatment was a revelation to me. I hope that the profession will give the salicylate of sodium a trial in subacute and chronic pleural effusions, and believe that they will be surprised and gratified at the results which they obtain.

Very truly yours,

J. H. STRAUGHN, M.D.
LEXINGTON, MO.

FORMULA FOR WINE OF COCA.

Coca-leaves, 3 ounces;
Cognac, 1½ ounces;
Sherry wine, 1½ pints;
Hungarian wine, 6 ounces.

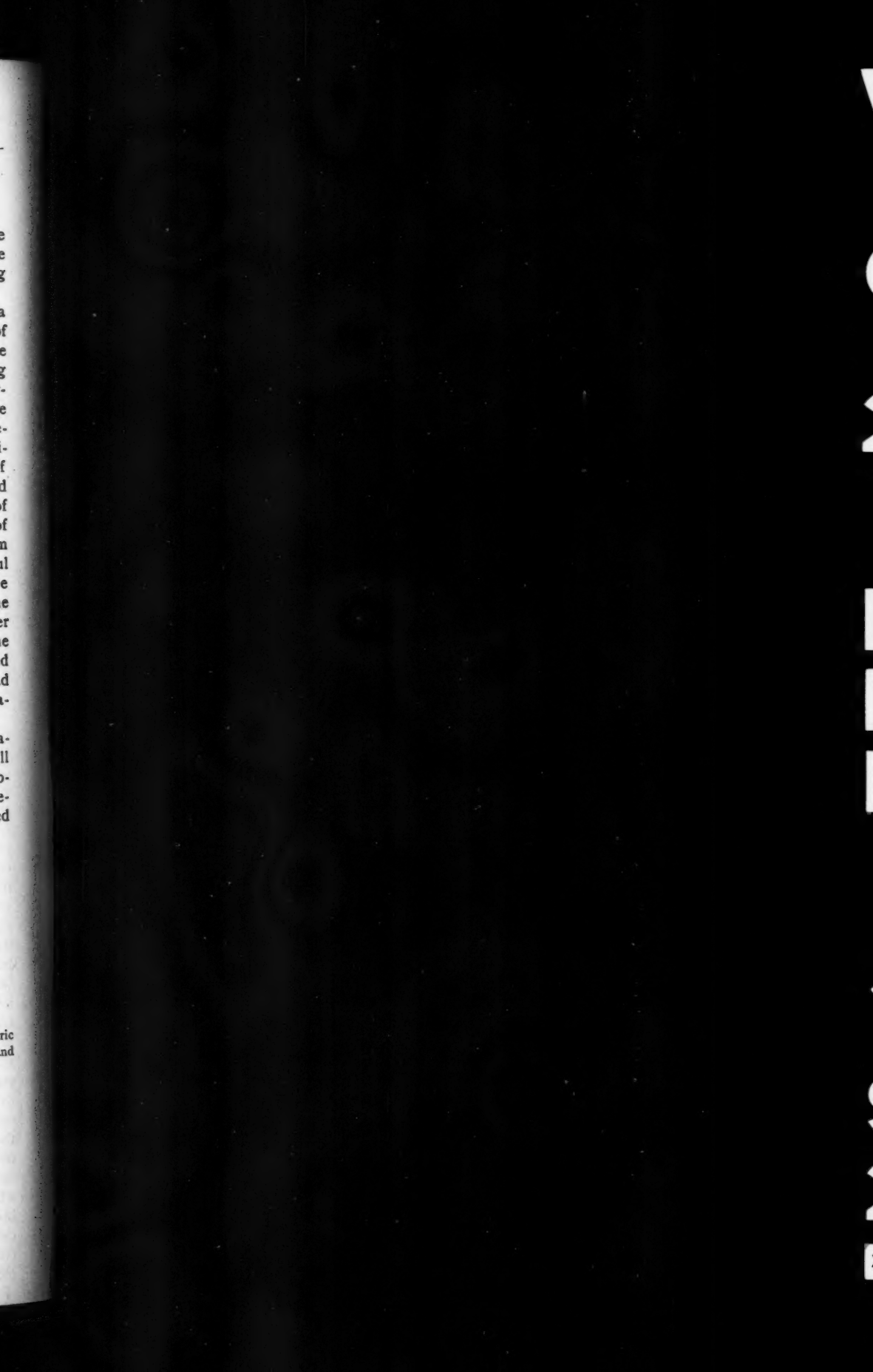
Macerate for several days and add 7 grains of citric acid. Allow this mixture to stand for several days and then filter.

—*Pharmaceutische Post*, No. 27, 1891.

MIXTURE FOR HEMORRHAGE.

Powdered ergot, 2½ drachms;
Sulphuric acid, 30 minims;
Distilled water, 1 pint.

Boil and evaporate to six ounces and then add

Alcohol, 6 drachms;
Syrup of cinnamon, 1 ounce.

—*Pharmaceutische Post*, No. 27, 1891.